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KOPPERS

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COKE AND GAS OVENS

The most efficient method of carbonizing coal is in KOPPERS OVENS and the best coke and by-products are produced by this process.

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Core Oven Properly Equipped with Gas Will Almost Entirely Eliminate Production Loss Through Improperly Baked Cores

Nine Principal Advantages of Gas for This Class of Work Enumerated—Success in Securing Installations Not Due to Present High Costs of Other Fuels.

By BRUNO RAHN

Industrial Engineer, Milwaukee Gas Light Company, Milwaukee, Wis.

The baking of cores can be subdivided into two classes: the baking of large cores and the baking of small delicate cores. The latter class of work especially offers a splendid and fertile field for industrial gas.

This class of work is to be found in brass foundries, malleable iron foundries, cast steel and cast iron foundries, and in such manufacturing establishments where foundry work is carried on in connection with the manufacture of certain standard machinery.

Experience has demonstrated that the drying of small cores can be carried on successfully with gas in three styles of core ovens, viz., such ovens as are equipped with rotary trays, ovens of the bureau drawer type, and the car type ovens.

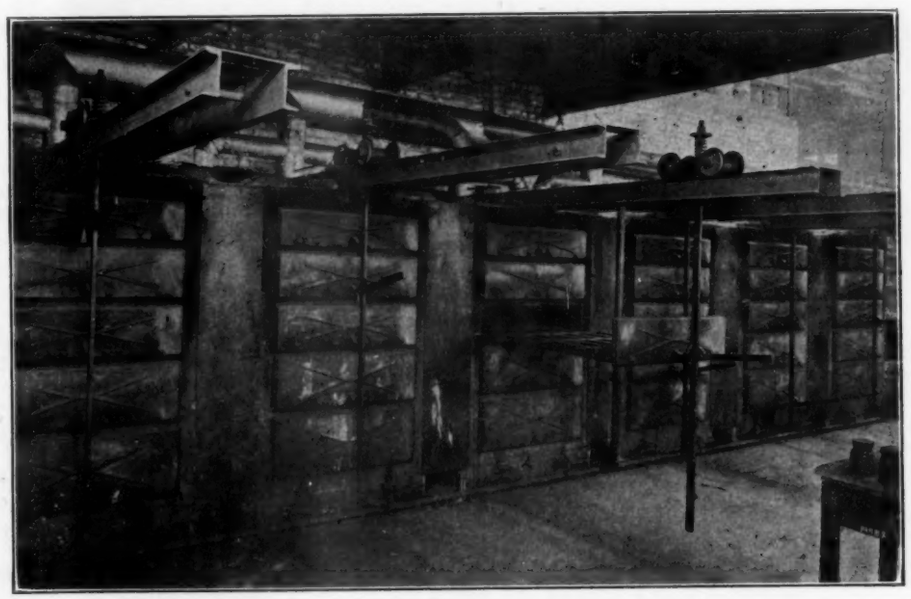

FIG. 1. BATTERY OF BUREAU-DRAWER TYPE CORE OVENS, GAS HEATED

Large cores and flasks are usually dried in spacious brick ovens of the car type.

Continuous core baking in ovens equipped with endless conveyors becomes feasible and practical due to the application of gas fuel.

Method Has Found Favor with Owners and Operators Alike

In all our experience no other class of industrial gas business has been more successful from the start. Core baking with gas has found universal favor with foundry owners and core makers alike, and we wish to state right here that the high price and scarcity of coke, coal and fuel oil, though favorable to the introduction of gas for this purpose, have not been the determining factors in its success.

As is commonly known, cores are made from a mixture of moist core sand with core compounds chiefly resin oils. The core is formed in a metal mold and the green core is then baked. Small cores can be baked

more rapidly than large cores. Bulky cores must be baked slowly so as to prevent cracking.

When large cores are heated too rapidly, the outer portions become baked before all the moisture has been driven off from the inner portions, hence the cracking of the core.

Successful baking of cores is dependent chiefly upon absolute temperature control. The temperature in the oven should be raised slowly up to a certain point and then held there for a certain length of time.

Cores are baked at temperatures varying from 380 deg. Fahr. to about 450 deg. Fahr., depending upon the size and style of cores and the compositions of the core mixtures.

When a core is subjected to excessive heat the core burns, its life is destroyed, and all the time and material expended in making it is wasted and the core is a dead loss.

When a core has not been baked properly, due to uneven heating, it is partially green and hence fragile and will break either in handling or else, when placed in the flask, during pouring, resulting in a totally spoiled casting.

It is therefore apparent that considerable loss in production may accrue to a foundry on account of improperly baked cores, not matter whether this is due to overheating or underheating.

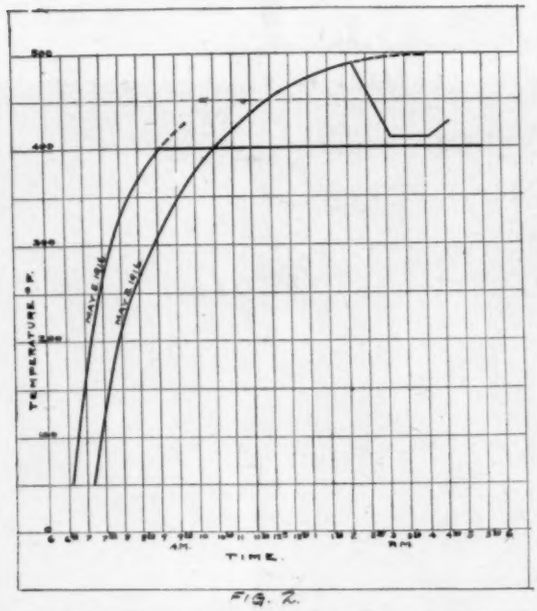

FIG. 2. TIME AND TEMPERATURE CURVES FROM OBSERVATIONS MADE WITH GAS-HEATED BUREAU-DRAWER TYPE CORE OVEN DURING TWO REGULAR WORKING DAYS

A core oven properly equipped with gas burners will almost entirely eliminate this loss.

That gas heat produced by a number of individually controlled burners is capable of more sensitive and absolute temperature control than coke or fuel oil fires is a fact most foundrymen will admit without much argument. Their domestic experience with gas, if nothing else has taught them that much, and when this ease of temperature control attainable with gas can be translated into dollars and cents by producing a hundred-per-cent-perfect core yield, hence increased production, it

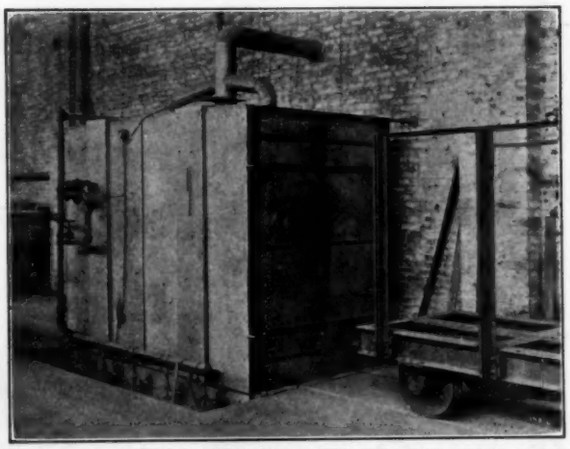

FIG. 3. A CAR TYPE CORE OVEN FOR MEDIUM SIZED CORES HEATED WITH GAS

presents a consideration too formidable to be ignored by any foundry operator.

Competing Fuels

But there is more to be said. Coke and fuel oil are the important and prevalent fuels with which gas must compete for this class of business.

Where coke is used for core ovens, valuable yard and foundry space is devoted to storage. Considerable labor is required to unload the coke, to wheel it to the ovens, and to haul away dirt and ashes. Firemen are required to charge the coke into the ovens. Constant repairs must be made to furnace arches and grates.

No matter how carefully the oven is designed with respect to draft and distributing flues, it is almost impossible to obtain any degree of perfect temperature control. Obnoxious carbon monoxide and sulphur gases added to the unavoidable fumes from hot molds vitiate the foundry air and do not make the foundry a desirable place for the laborer to work in.

Where oil fuel is used similar conditions prevail. The first cost of an oil storage system, together with the necessary auxiliary apparatus of pumps, compressors, and air, oil and steam lines, is considerable. Depreciation and up-keep are an item and must be added to the fuel cost. To keep an adequate supply on hand has been no small worry to many a foundry manager in these uncertain times.

Where large cores are to be baked, the intensity of the oil fires makes a slow, even baking almost impossible. Car axles and journals are soon ruined due to the intense oil heat. Imperfect combustion fills the foundry with oil fumes.

In small ovens, for baking small cores, an oil fire is out of question.

In this day of ever increasing scarcity of common labor, and consequent high wages, in these times of intensive high production requirements, gas fuel for core oven work offers advantages and qualities which eliminate to a large extent the difficulties and trials attendent upon the use of coke and fuel oil. Compare the ease and simplicity of lighting a set of gas burners to the arduous task of building and starting a coke fire. Compare the mild and well distributed heat from an atmospheric drilled pipe gas burner to the concentrated and intense heat of an oil fire.

Absolutely perfect combustion can be obtained with gas, hence the elimination from the foundry of obnox-

ious and poisonous carbon monoxide and sulphur fumes.

The burning of gas fuel can readily be made to meet the approval of the strictest factory regulation and fire insurance underwriters' requirements.

The "ever readiness to serve" feature of gas fuel, the fact that but a valve needs to be turned on and the fuel is present, ready for use, eliminates considerable "overhead" worry and expense, results in saving of labor which can be put to other use, and releases valuable storage room and floor space for additional manufacturing purposes.

Battery of Bureau-Drawer Core Ovens

Fig. 1 illustrates an installation of a battery of six bureau-drawer type core ovens heated with gas. This type of oven is used for drying smaller cores only.

The shell of each oven is 6 ft. 8 in. high, 4 ft. wide and 6 ft. 7 in. deep. The trays are 3 ft. by 6 ft. each.

Each oven is heated by two atmospheric drilled pipe burners, equipped with individual pilot lights and cast iron baffle plates.

The ovens are well insulated and placed upon a fireproof sub-base of concrete; same thickness as the concrete floor.

They operate at a temperature of about 400 deg. Fahr. with a gas consumption varying from 275 cu. ft. to 300 cu. ft. per hour per oven. Each oven is capable of keeping from 8 to 10 men busy.

The cut strikingly illustrates the absolute simplicity of the entire installation. The first cost of the entire installation is low as compared to that of coke-fired ovens of this type, there being no need for brick settings or underground furnace construction. Each oven is provided with a thermometer.

Fig. 2 is an illustration of two "time and temperature" curves plotted from observations made with a gas-heated core oven of this type during two regular working days.

The curve, plotted from observations made May 5, 1916, shows that the temperature can be brought up evenly to 400 deg. Fahr. and then maintained at this point for the rest of the day.

The curve plotted from observations made May 2, 1916, shows that the temperature can be readily and evenly brought up to about 500 deg. Fahr., and then lowered or increased promptly by proper burner manipulation.

The gas heated bureau-drawer type of oven is particularly popular with core makers for several reasons. Operators are not exposed to core fumes or direct heat from the oven for the individual drawer backs completely close up the oven, when the trays are drawn out for loading.

Where core makers are working on the piece-work basis, as is customary in many foundries, the high percentage of well baked cores due to perfect heat regulation insures them pay for all work done.

Gas heated ovens of this type are portable and can be readily moved from one part of the foundry to another, often resulting in labor saving in transporting cores to molds.

Car Type Core Oven

Fig. 3 illustrates a car type oven heated with gas for baking medium sized cores. The dimensions of this oven are 8 ft. 6 in. long, 5 ft. wide and 8 ft. high. The oven is equipped with swinging doors at both ends and provided with two cars; one car loaded with cores is pushed into the oven for baking, while the other car is being loaded outside with green cores, constituting practically a continuous time saving core baking process.

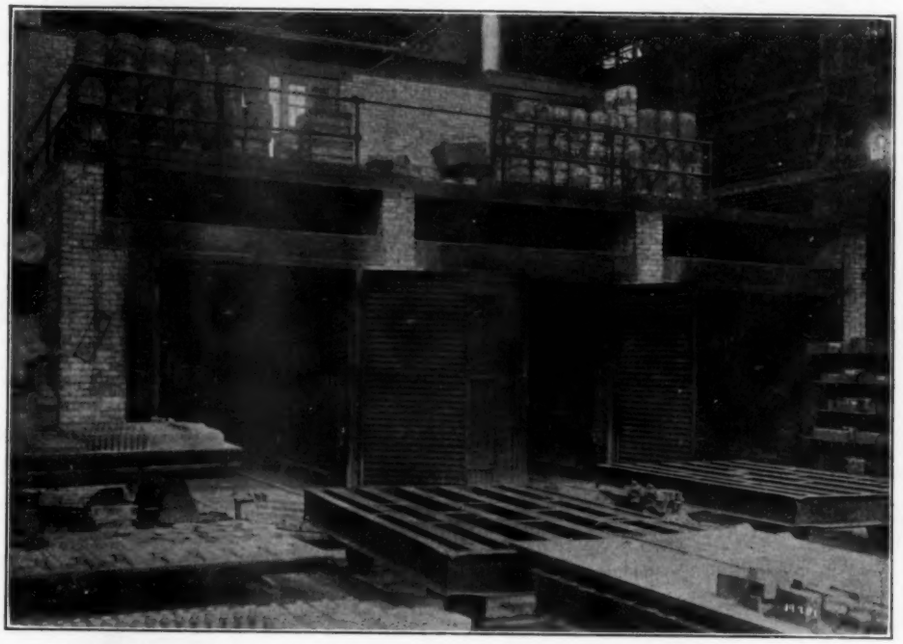

FIG. 4. BATTERY OF THREE CAR TYPE BRICK CORE OVENS FOR LARGE CORES

This type of oven is also heated by means of atmospheric drilled pipe burners, which are provided with a thermostatic gas shut-off control, operating automatically. The oven is also well insulated, having the advantage of speed, no time being lost in loading or unloading the oven.

30-Ft. Burners Can Be Adjusted to Consume from 1,200 to 2,000 Cu. Ft. of Gas Each

In Fig. 4 is shown a battery of three car type brick core ovens, heated with gas and used for baking large cores and for drying flasks.

The inside measurements of each of these ovens are 32 ft. long, 10 ft. 8 in. wide and 9 ft. 9 in. high.

These ovens are each equipped with two blast air and gas, drilled pipe burners, 30 ft. long, introduced through the rear wall of the ovens. Fig. 5 shows this better.

The temperatures in these ovens during a baking period are observed by means of Bristol recording thermometers, a chart showing a record of one baking period being reproduced in Fig. 6.

As can be noted from the chart, the burners were lighted at 6 p. m. and the temperature in the oven was rapidly increased to about 300 deg. Fahr., after which

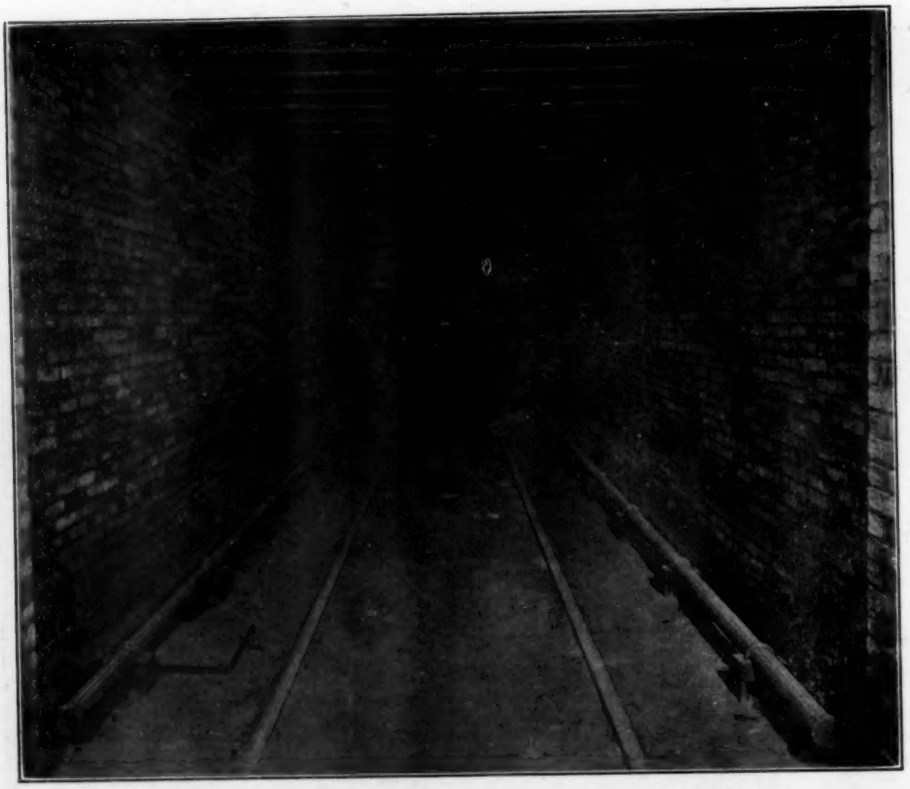

FIG. 5. GAS BURNER EQUIPMENT OF CAR TYPE BRICK CORE OVEN

time a gradual increase in temperature takes place for about 3 hours. The maximum temperature to which the oven is heated is 500 deg. Fahr. The gas is then shut off, awaiting the removal of the loaded car.

The 30-ft. gas burners can be adjusted so as to consume from 1,200 cu. ft. of gas to 2,000 cu. ft. apiece.

The even heat distribution obtained in an oven of this kind with gas burners constructed as shown, can not be duplicated with coke or fuel oil. The result is a better core yield, a considerable item where large cores are concerned, time and labor-saving due to ease of operation and absence of fuel cartage, and a longer life of car wheels and axles.

In Fig. 7 is illustrated another large brick core oven heated with gas and loaded with cores and flasks ready for action.

From the standpoint of the gas manager, this class of business offers a field well worth exploiting. The core-baking with gas affords a long hour, constant load, consumption, not seasonal, and can be taken care of usually with service extensions on old mains.

To sum up, the advantages which recommend gas-heated core ovens to foundrymen and core makers alike are:

1. Absolute uniformity of temperature insuring even baking of cores, no burning of cores, hence no waste, saving in resin oils.

2. Where cores are made on a piecework basis, core makers are insured a higher yield due to the elimination of loss on account of faulty baking.

3. Speed of operation, quick initial heating up, no dying down of fires.

4. Saving in labor. No fireman, no need of fuel storage or fuel transportation. Absolute ease of loading oven with cores.

5. Cleanliness of operation resulting in sanitary conditions for workmen. Operators are not exposed to obnoxious carbon monoxide fumes or direct heat from the oven.

6. Portability of apparatus, which may result in labor saving in carrying cores to mold.

7. High heating efficiency due to proper insulation and good construction.

8. Comparatively low first cost of installation as compared to coke-fired ovens. No underground brick furnaces, no brick settings, simple foundation.

9. Low maintenance cost, no necessity for repairs.

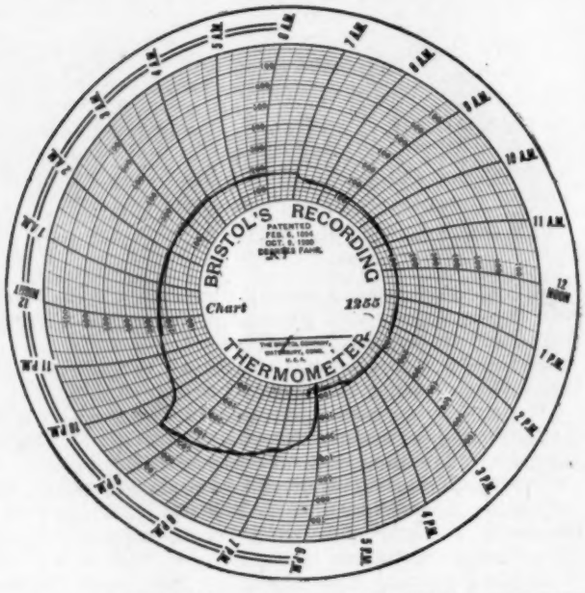

FIG. 6. RECORDING THERMOMETER CHART FOR CAR TYPE BRICK CORE OVEN

Defines "Engineering"

Engineering is a mode of thinking. Any man who considers all his problems without prejudice, who clearly discerns the facts from the opinions—the essentials from the non-essentials—and who searches continually for new truths and better methods, who is not controlled by superstition or precedent, who analyzes constructively or constructs, analytically, is an engineer. His field of work may be medicine, law, architecture, agriculture, mining, merchandising, machine design or chemical research.—*C. R. Dooley.*

Defines the Rules of Handling Men

Willard Beahan Offers Various Suggestions Toward Solving this Difficult Problem

"The most difficult branch of engineering and at the same time the most important is the engineering of men." Those are the words of Robert Stephenson, spoken about 1830. Robert Stephenson was the son of George Stephenson, and George Stephenson built the first locomotive. The Stephensons have been called the fathers of railroad engineering. Robert Stephenson outlived his father, and during the last years of his life he laid down this great human law. George Stephenson, the father, laid down another law—"Competition is impossible wherever combination is possible." So you have those two laws of son and father. They are the horizon laws in the engineering of men, declared Willard Beahan in a paper presented at the Congress of Human Engineering at Ohio State University.

The First Rule in Handling Men

It would never have been possible to have had the vision in human engineering we have, had it not been for Robert Stephenson. When a man has a broad, comprehensive view, he can lay down horizon laws. Services are like everything else, they are great and wonderful because civilization needs them. The growth in railroads has been rapid, but I maintain the engineer can explain his own plans better than any man can for him. I don't propose to take a back seat with any lawyer talking engineering.

The first law in handling men that I would lay down is an old one. The first needs are always old. You will find it in the book of Luke, chapter six and about the thirty-first verse, "Do unto others as you would have them do unto you." It takes a brave man to carry it out. If you do not include this rule in your practice you will be a failure as an engineer of men. Whatever else you do, if you can't put yourself in the place of the other fellow, you will fail.

FIG. 7. CAR TYPE BRICK CORE OVEN USED FOR BAKING LARGE CORES AND FOR DRYING FLASKS

General Dodge used to tell us it was a great deal harder to find a man to take *care* of a brigade during the great Civil War, than it was to find a man who could "fight" that brigade, more difficult to find how to take care of three thousand men than to lead them in battle.

Let me cite one fact of history. Our national climax, historically, certainly the greatest in my lifetime, was the Battle of Gettysburg on July 3, 1863. It was Pickett's charge that would turn the tide, that ought to settle the war. The brigades were lined up by transits so they wouldn't bunch. The Union forces could see them coming. It happened to be the second corps of the Union army under Hancock which had to withstand that great charge. There was open ground to cross for nearly a mile. That charge came nearly succeeding. I will not go into detail—Hancock was shot while sitting on his horse as the charge started and a piece of his saddle was carried into the groin, making a bad wound. In his hand was found, as he lay wounded, the usual tablet officers used for writing orders. On it he had nearly finished what order? Why, to his commissary officer directing that a ration of fresh beef be ready for the soldiers of the second corps that night. At what he knew must be the summit of his career, General Hancock put first the care of the men in his charge. I think the young man in going out can well think of taking care of his men. If he doesn't he won't have any command to lead.

Carrying the Men on the Heart as Well as on the Payroll

The third law is this: Carry on your heart the men you carry on your payroll. I was division engineer on the Lehigh Valley Railroad when Amos Turner was master mechanic of that division. When going through his shops he would speak to every one. Upon being questioned about it, he said, "I started in when I was a boy, I know them all, it is a little thing to speak to a man and ask about his wife and the home." There were strikes in other shops, but in this one they had no strike. Simply because Amos Turner carried his men on his heart, and they will never have a strike as long as he is there.

When I became connected with the New York Central Railroad the steam shovels were put in my charge. There were two labor unions in that craft, bitterly opposed to each other. When the men asked me how I stood in the matter I said, every man may join one union or the other union or no union or both unions and must allow every other man that same privilege. I carefully made a seniority list and promoted men according to that list. I let them work as near home as I could. I told them if they heard anyone of their family were sick to turn their machines over to the next oldest man in their crew, wire me of it and take the first train home—that they must take care of their families and I would take care of the Company's interest. Remember that men are human. If you don't you will have strikes. If you do not feel an interest in the men under you and in their families let some other man handle that force for you *never can.*

Value of Personality

The engineer must have personality. The next qual-

ity is discipline. Some man has well said, that while battles have been won by poor generals, no battle was ever won by a debating society. I don't mean for you to use army discipline, but all of it save the shoulder straps. I mean the man in charge must have undisputed charge. He must have the authority. Then he must be right, legally and morally. He must be just. He must have sympathy. He must know human nature. A thing is not right because he says so, but he must say so because it is right. He may be a despot but he must be right. The engineer will be held responsible for these men and all other men under him, when he stands the last day before the great bar of justice. He must administer discipline. He must create about him a despotism as it were, controlled by humane principles.

The last quality needed is fair treatment. It may be the master and servant idea. We can never get back to those days when the boy was taken into the master's family to raise. The men with the brass collars in railroad service are the men who take the place of the master. Pay up, agree to pay to the last cent and pay promptly. Pay enough but be reasonable. You can never buy loyalty. Pay promptly, and pay in full. Occasionally you will have trouble. The human machine is a great machine, and it requires a great deal of knowledge of psychology in dealing with men. Though I haven't had a strike, I have seen a little trouble. The engineer must let the human element enter in in dealing with his men and must listen to their troubles and be one with them in solving them. He must forget self.

Unquestioned Authority

You, as engineers of men, are bound to have some trouble, when handling the laboring men more than others. In handling common labor there should be no question about authority—I have already touched upon that enough. If you are put in charge don't be foolish enough to allow other men to come around and mix in. Men must get instructions from one man. You must not be fussy and nervous; see everything, but don't notice everything. You may see things which are not going just right, for instance around the cook house. But you must not notice everything. The cook's temper is often sorely tried. It is the same way with the foreman of the gang; don't notice everything; don't notice more than is necessary. In handling labor you must be right. You can't fool a hundred men, you might fool one, or you might fool them one day in a month. But you must have the right on your side, not only legally but morally and mentally as well.

I never make or have trouble with the labor unions. I let unions come in and organize, but it is my job to stand nearer those men than any organizer. I can do more for those men than unions. The labor union is not a law of the land; in no way are syndicates or capital organizations laws of the land; politics is not a law of the land.

Don't have majority rules; sometimes majority is overthrown. I am inclined to think the majority is not infrequently entirely wrong.

Crude Petroleum Movement in June

The following comparative summary of crude petroleum movement in June, 1917, represents the operations of 143 pipe-line and refining companies that handle or receive oil direct from the productive fields east of the Rocky Mountains and is compiled from reports received by the United States Geological Survey, Department of the Interior, prior to noon of July 30, 1917.

This compilation includes statements filed by
34 companies operating in the Appalachian field.
9 companies operating in the Lima-Indiana field.
5 companies operating in the Illinois field.
66 companies operating in the Oklahoma-Kansas field.
9 companies in the Central and North Texas field.
7 companies operating in the North Louisiana field.
7 companies operating in the Gulf Coast field.
6 companies operating in the Rocky Mountain field.

Crude Petroleum Moved from Field Sources

(Barrels of 42 gallons each)

Field	June, 1917	May, 1917	June, 1916
Appalachian	2,001,650	2,090,106	1,708,290
Lima-Indiana	307,053	321,279	344,712
Illinois	1,041,721	1,110,386	1,178,452
Oklahoma-Kansas	11,367,735	10,612,982	13,293,721
Central and North Texas	879,520	862,029	835,887
North Louisiana	796,944	801,537	1,039,962
Gulf Coast	1,860,397	1,978,750	1,747,176
Rocky Mountain	722,719	716,546	537,553

Crude Petroleum Delivered to Refineries or Consumers

Field	June, 1917	May, 1917	June, 1916
Appalachian	2,373,688	1,986,401	2,414,578
Lima-Indiana	1,515,315	1,547,559	1,814,275
Illinois	312,739	399,963	302,499
Oklahoma-Kansas	6,929,452	6,701,691	6,538,806
Central and North Texas	861,659	1,256,302	757,190
North Louisiana	828,182	1,021,213	1,178,433
Gulf Coast	2,106,954	2,059,688	2,447,977
Rocky Mountain	744,569	741,008	461,692

Stocks of Crude Petroleum at End of Month

Field	June, 1917	May, 1917	June, 1916
Appalachian	7,379,228	7,127,247	7,651,295
Lima-Indiana	4,833,306	4,659,643	4,270,161
Illinois	4,220,755	4,654,616	6,681,964
Oklahoma-Kansas	94,050,736	93,645,377	91,311,740
Central and North Texas	2,903,028	2,672,153	5,577,615
North Louisiana	4,380,693	4,473,088	5,137,928
Gulf Coast	8,422,252	8,682,057	9,209,465
Rocky Mountain	727,673	759,867	479,552

Note.—Statistics of petroleum movement in California are not included in this tabulation, because of delays incident to securing first hand data.

The foregoing summary indicates, with regard to petroleum moved from field sources, increase over last year only in the Appalachian and Rocky Mountain fields, and increase over May, 1917, only in the Oklahoma-Kansas, Central and North Texas, and Rocky Mountain fields.

With regard to oil consumption the tables of deliveries show increase over last year in all fields except Lima-Indiana and North Louisiana, and increase over last month in the Appalachian, Oklahoma-Kansas, Gulf Coast, and Rocky Mountain fields.

Stocks increased slightly in June in the Appalachian, Lima-Indiana, Oklahoma-Kansas, and Central and North Texas fields, compared with May, but exceeded stocks held at the end of June last year only in the Oklahoma-Kansas and Rocky Mountain fields, where the current increase affects only the large transportation and marketing companies.

Engineers in Regulatory Commissions Can Well Afford to Give Less Attention to Valuations and More Attention to Other Items Relating to Fixing of Rates

William J. Norton Declares Too Little Literature is Devoted to These Items; Particularly That of Sane and Equitable Rates—Deplores Lack of Incentive in Customary Regulatory Practice

When we take up the subject of rate regulation, and go into the papers and books that are written upon the subject, we find that these books deal almost entirely with the valuation problem, and when we go over the work of the commissions we find that they themselves are devoting almost all of their attention to valuations, declared William J. Norton in a paper recently presented before the Western Society of Engineers. The result of that is that the other elements of rate making have been somewhat neglected and I believe that the engineers on the commission can afford—can well afford to give less attention to the valuation end of the rate problem and give more attention to the other items.

I just want to call your attention to the various things that enter into a rate case:

1. Valuation
2. Rate of Return
3. Current Operating Expense
4. Deferred Operating Expense
5. Operating Revenue

For the purpose of this paper I shall assume that a formal complaint has been made to a commission as to the rates of a utility, and following the usual procedure, that a complete valuation has been made by the company, and also an independent valuation made by the commission and by the city, and that all of the facts have been presented to the commission, and after due consideration the commission has finally fixed a certain amount as the proper rate-making value of the utility.

In other words, we start off with one of the following five elements of a rate case determined, namely, the value of the property. The other elements which must be decided are as follows:

2. The fair corporate return to which the utility is entitled. This requires a determination on the part of the commission, of a fair rate of return, which when applied to the value found gives the proper corporate return.

3. The determination of a proper annual amount for current operating expenses.

4. The determination of the proper amount for deferred operating expenses or depreciation.

The sum of the fair return, the current operating expenses and the deferred operating expenses, will give the total revenue which it is proper for the company to earn.

5. The existing revenue of the company must then be studied and established, and if it exceeds the proper revenue, as determined above, a reduction must be made in the rates to the extent of such excess.

Disproportionate Attention to Valuation

As we look over our cases before commissions we find that, as a rule, practically all of the money and time in such an investigation is spent in the determination of the value, and little or no attention is paid to the other four items, and the reduction is made in an arbitrary manner without any real study as to the results obtained under each rate in the schedule.

You know in case after case the testimony relating to values occupies months and months and years and years, and both sides are worn out and they want to get it over with and they want to compromise or settle in some way, and after all the money and time is spent on the valuation proposition we see the commission jumping directly from the valuation to a settlement of the case, and, as a matter of practice, many of our cases have been settled as a result of actual trading at that point and, as a matter of theory, the trading could have been done from the beginning with nearly as much effect and certainty without the expense of making the valuation.

Unfortunate Precedent Set

This looks like a very broad and more or less unfriendly criticism, but as the cases are constituted, especially the ordinary cases of the commission, we find them jumping at a conclusion and getting a certain result in that particular rate case, and then they are afraid later on to change the rate of return that they laid down in the earliest cases. Now, it is my opinion that some of the commissions would have been better off if they had simply traded without any valuation and without committing themselves as to the rate of return. As I stated before, the company has no records by which the commission can give six, or six and a half, or eight per cent, and sometimes we spend days in explaining why a higher rate of return would benefit the public and the company, but, as a rule, all such testimony has been absolutely discounted, the companies have gotten no result from explaining their position in the matter, and after it is all over the commissions do just exactly what they please.

Now, the right of the commissions to decide what a fair rate of return should be is probably the biggest and greatest responsibility that they have, and I have searched through the decisions and talked with the commissioners and I have pretty generally failed to find any real appreciation of this enormous responsibility which they have, and which they have in my opinion failed to use properly.

The purpose of this paper is to bring out, as far as may be possible, the relative importance of each step in a proper rate-making procedure, and especially to call attention to the neglect that has settled upon all of the elements except the valuation.

Indeed, it is a pertinent question as to whether or not if a part, and indeed perhaps the greater part, of the time and money so spent could not be better used on some of the other items, rather than, as now is the practice, to spend it almost entirely on the first item, the valuation.

The commissions assume that the valuations, generally made on the reproduction new basis, are absolutely necessary to sustain a decision, because all of our rate precedents come from court cases, arising in general under the fourteenth amendment, where the

question of confiscation of the property is the only question involved. The court cannot decide whether this property, or the fair profits of the same is being confiscated unless it knows the value of the property. The commissions, however, under the public utility laws, are not necessarily concerned with property, but have broad regulatory powers, and under them are fundamentally burdened, in the interests of the public, with the broad question of obtaining the best and most complete service at the rates which will best accomplish this result. This is entirely different from the usual assumption made by the commissions that it is their duty to secure the lowest possible rate for the small user.

Commissions Have Failed to Understand their Broadest Duties

It is not surprising, therefore, that the commissions have not been as successful as they should have been in the handling of rate cases; because they have failed to understand their broadest duties, and to a large extent have failed to use all of the tools which have been given them, but have insisted upon using the one tool, the valuation, to the practical exclusion of all others, and of using it so extravagantly that they have been forced to jump to hasty and arbitrary conclusions as to rates.

It may pay us at this point to briefly consider the other tools which the commissions have at hand and generally fail to use properly.

Perhaps the most significant of these is the right of the commission to decide the rate of return to which a utility is entitled. This is a tool which they use, but use so clumsily and carelessly that they would be better off if they did not use it at all. The companies under regulation, as a rule, cannot bring to bear upon the commissions any facts regarding the rate of return which are not promptly discounted by the commission. Usually in its first decision a commission spends so much time on the valuation that it has no time left for a proper consideration of the rate of return. If the valuation comes out higher than they expected, a rate of return is automatically reduced. If the valuation comes out lower than is expected, they are inclined to be more liberal with the rate of return, provided that a certain amount of reduction in rates is still possible.

In my opinion the arbitrary power of the commissions to decide what is a fair rate of return is the most important and far-reaching tool that they have at their command. It certainly should never be used to obtain a temporary result in the way of rate reduction. Its largest use in the hands of an intelligent commission should be to build up, in their own state, the possibility of the broadest and most comprehensive service that is possible.

Rates Adopted to Bring Into the State the Capital Necessary for Develpment of Its Utilities

Some of the commissions have used this rule properly, notably California and Maryland. California considers that an 8 per cent return should bring into the state all of the money that is necessary for the development of its utilities, and Maryland has also advocated such a rate of return. On the other hand, we have in Illinois a commission which says that 7¼ per cent is a sufficient return, and the neighboring State of Indiana is convinced that seven per cent is sufficient. In the long run, when regulation is better understood by investors, we may expect to see money flow into California and Maryland, and a disinclination to invest in Illinois or Indiana, with a result that service will deteriorate and extensions and improvements cannot be financed.

They have almost implied that if 8 per cent won't bring the right rate into California, they will make a higher rate. Maryland has decided the same thing, and still it hasn't quite as high a rate, but it is very liberal. On the other hand, in Illinois we find a commission which has established the rate of 7¼ per cent and it has consistently stuck to that as a fair rate of return, and in the neighboring state of Indiana we have an even worse situation, where they think 7 per cent is a sufficient rate of return.

Determining Proper Operating Expenses

In determining proper operating expenses, the general commission practice is to make a simple audit of the operating expenses. Occasionally, some obvious overexpenditure may be thrown out, but no attempt has been made on the part of any commission to make a real study of the efficiencies and economies of operation, or, on the other hand, to determine if waste or extravagance has prevailed. Up to this time there has been no difference in the treatment of operating expenses between the best and most efficient company and the worst. There is no doubt that much time could be profitably spent by the commissions in studying this problem, perhaps the largest and most important problem that confronts them. The commissions have the right under the law to acquire annual reports, and these reports could be improved so that the relative efficiency and economy of the operation of every like company under its jurisdiction could be determined. This has not been done. Why? As a matter of practice, we find the commissions use antiquated forms of annual reports copied from one commission to another, or from the interstate commerce reports. No study is made of a useful or proper form, and while they take a great deal of time to prepare on the part of the company, they are rarely used except for practically worthless statistics printed in a voluminous annual report, which is read by no one.

I think I speak advisedly. I have seen store-rooms filled with reports that it took the company months to prepare and the only worry in regard to them was for some file clerk, as to what he should do with them. If they cannot be used for constructive purposes the commission ought not to ask for them.

The annual and other statistical reports of the commissions should be acquired only when there is a definite use for such data. They should be carefully and thoughtfully worked out, and when received, should be used for a constructive purpose. Here the commissions have a real tool, which is practically unused.

Actual Operating Expenses Should Be Studied with Great Care

In a rate case, it is obvious that the actual operating expenses of the company should be studied with great care and with particular reference to the efficiency and economy which has been exercised.

Now, this is a very big problem. Most of the engineers and lawyers in presenting their pleadings have been very careful not to bring up this point. They generally felt that there was hardly a commission in the country, probably outside of the old Wisconsin commission, that really understood the subject well enough to thoroughly appreciate what operating expenses really meant and what they stood for. The result has been that as the commissions have done nothing about the

operating expenses, the companies have been satisfied to leave well enough alone and they themselves have not brought up the subject; but it is right on this particular point that in future rate making, if we make any progress, great good can come.

The problem is involved. Probably everyone who has been in any way connected with rate regulation or rate making has established in his own mind that eventually there must be developed some method of rewarding efficiency, and as a corollary, punishing inefficiency—penalizing inefficiency. But nothing has been done. I remember talking to one of the Wisconsin commissioners several years ago and he pleaded that there was great pressure upon a commission to do other things and do their routine work and grind through their cases on the old valuation return. There are so many conditions to be deducted from the revenue theory and take up so much of their time that, while they appreciate something must be done to reward efficiency, they have really no time to take up such a complicated subject. But some engineer, some day, will make himself famous by getting into the operating expense of our utility companies and devising a workable plan whereby efficiency can be properly rewarded.

There are probably greater possibilities in development along these lines in connection with the regulation of utility rates in the future than in any other part of the complete rate study. In New England and in Massachusetts the attempt has been made to reward efficiency of operation by the so-called sliding scale method, but this is a crude attempt to fix a ratio between rates and dividends which, while it has to a certain extent been beneficial, has not been entirely satisfactory on account of the arbitrary nature of the relation.

Depreciation

Under the fourth item, that of deferred operating expense or depreciation, very little has been actually accomplished, and necessarily so because the oldest of the purely regulatory commissions are but eight years old, and as the theoretical average life of an electric light plant is not less than sixteen years, none of the commissions has had the opportunity of making a study of a complete cycle in the life of such a utility. The preparation, however, of the necessary data for a complete study of depreciation, especially in its relation to maintenance, should be made by every commission, and in another ten years, there will be no excuse for a lack of complete data on this subject.

A study of the existing revenues of an electric utility has been made in many cases, but nowhere do we find a complete and thorough analysis of the revenue from the various classes of business, and for the different size customers under each class, that we should expect to find, in a decision which attempts to spread, over all of the revenue, a certain reduction.

Nor do we find in the commission decisions any careful study of the average rate, which is received by customers of the various sizes, under the different rates in the schedule. The attention of the commissions seems to be directed entirely to the maximum rate of the small users, and their studies are made almost entirely for the benefit of this class, so that it is not surprising to find that this is the only class which receives the benefit of the commission reductions, and adjustments in rates for other users are left entirely to the voluntary and practically unregulated action of the companies themselves.

There is no doubt that all rates must be carefully studied before an intelligent deduction can be spread over the schedule.

There isn't a single incentive, under existing state regulation, for any efficiency, any economy, any hustling, to make up for the reductions to the public, and if the company has simply maintained its rates from the beginning and rested on its oars for the three years, they would be much better off than if they, on their own initiative, had made the three reductions.

This brings out clearly to my mind that the methods used by the commissions have heretofore afforded no incentive for progress, efficiency or economy on the part of the companies, and the company that is not progressive is in better shape to stand existing regulation than the company which has energetically pushed its business and voluntarily reduced its rates as its revenues increased.

I think it was Commissioner Moffat, several years ago, who called my attention to another phase in the valuation question for rate making. I pointed out that the companies were very foolish to go through the valuation just before they put in any big unit in their plant or just before they increased their service to any extent. He said, in his opinion, rates should be fixed 10 per cent, plus or minus, if the companies were only clever enough to pick out just the exact moment under which they were to be regulated, and if they were regulated under the existing practice just after they built a new plant and elaborate extensions, they would be 10 per cent better off than if they were regulated just before those extensions were made.

Regulation Continuous

Now, while I have seemed to speak against regulation, I have rather done it purposely because I think everyone else has tended to emphasize the importance of valuations and to neglect the other elements of the rate-making problems.

The commissions seem to forget that under the law regulation is continuous, and both the cities and commissions strive to get the largest possible reduction that can be figured out, and then hand it over to those who have done the least to earn it. If regulation is to be practical and helpful, as it should properly be, our rate reductions will take the form of frequent small reductions applied throughout the entire schedule, so as not to seriously impair the revenue from any class of business, and the companies themselves will be encouraged to make such reductions voluntarily, and if they do, they will receive as much credit, and in all fairness they should receive more credit than if the rates were reduced by the commission itself upon complaint. What we need is constructive and not destructive regulation, so if regulation heretofore has not been destructive in the large part, it is the result of luck rather than of any good intention on the part of the commissions, in that errors that have been made have been covered up by the rapid growth of the business.

This will probably continue to be the case with the electric companies, but on the other hand, we find that the gas companies and the water companies are reaching a breaking point where the arbitrary methods used by the commissions will no longer work, and unless a change is quickly made in the method of regulating such companies, by the assumption that rates can always be revised downward, we may expect to see such cases carried to the courts upon the theory of confiscation, but even this relief is far from satisfactory, as there is a wide margin between confiscation and fair regula-

tion, which the commissions should recognize, and through which adequate service, requiring as it does a large annual investment for improvements and extensions, can only be safeguarded.

There is one other phase of the present reproduction new valuation basis used by the commissions, which is brought out by the present increased cost of material. It has been called to my attention in a valuation made and fixed by a certain commission in the latter part of 1916, where the company endeavored unsuccessfully to sustain a base price for copper of 19 cents.

Not six months later the engineers of the same commission were allowing in another valuation a 27-cent basis for copper, and this will probably be sustained by the commission, so that one city in the state will have rates based upon a fundamental unit of value, which is 50 per cent higher than in the first city.

In my opinion, no reproduction new valuation can be absolute. Such a valuation should be used, if made by the commissions, only as a partial check in determining what rate adjustments should be made.

Cost Analysis

Valuations may have another use, and one that is generally forgotten. This is the much disputed cost analysis, and such analyses cannot be made unless the value has been determined and carefully allocated to the various services in which the investment is used. The utmost care must be taken in such allocations, but even where the detail is carefully worked out, elaborate assumptions must be made, and the results obtained are averages of costs, and not actual cost.

A single cost analysis, under any condition, no matter how carefully it is made, has no absolute value. It is an indication of cost; it shows the cost curve which is a sort of a zone of reasonable doubt, and one or two of the companies, especially in the West and on the Pacific coast, have attempted to make those analyses and submit them to the commissions. As a matter of fact, the commissions have simply criticised these analyses, and they took up this assumption or that assumption. I know in one case where they made an arbitrary formula of their own and established a direct relationship between the adversity factor and the load factor, which made the whole calculation come out about the way they wanted it, for the purposes they had in mind. On the other hand, if the commissions would only realize that the costs are the same each year with the same conditions, these analyses over a period of years would afford a safe basis, indicating where proper changes in the schedule rates should be made.

Some of the commissions, notably Wisconsin, have made such analyses, but they seem to have failed to understand that the value of any single cost analysis is not absolute.

For instance, in a certain cost analysis made after a detailed valuation, it was actually found that not less than 5,000 opinion assumptions not supported by actual data, had to be made. It is, therefore, obvious that the result obtained cannot in any sense be considered actual cost, and as a matter of fact, it is probable that not two persons, even if both were skilled in such matters, could have possibly reached the same conclusion.

And here we again come upon another danger of existing commission regulation, because the commissions which have made such cost analyses have assumed that they were absolute.

The cost analysis has a very valuable function, however, in spite of its frequent misuse. If such an analysis is made over a period of years, as has been done by one electric company that I know of, and the same assumptions made from year to year, but improved as more and more data of real reliability were secured, the general trend of the analysis year by year becomes accurate, and the results of such a study as applied to any rate in schedule could be reliably and safely used in determining whether each rate in the schedule needed adjustment.

No commission to my knowledge has had the patience to work a cost analysis out carefully over a period of years and, as a rule, as the results shown by a single analysis are used as an absolute basis for rate reduction, it is the experience of most companies that to present such a cost analysis is an extremely dangerous and ill-advised proceeding.

The commissions, of course, may have some justification in the fact that the rate-making of many electric companies in the past has been as unscientific as their own methods, but of late years we find that the companies are more and more developing a careful compilation of the results obtained under each rate in the schedule, sometimes supported by an annual cost analysis, the combined results of which are of absolute value, and such information is used by the companies whenever rate adjustments are made.

Valuation Only a Part of Rate Making

There are just two thoughts that I want to leave with you as to this part of the paper:

The first is that valuation is only a part of rate making. I may be a little prejudiced on the subject, but I feel that it isn't as important a part of rate making as the other items.

The second point is that eventually we must work out in our rate making some reward for efficiency and economy of operation. Our regulation will not be complete and our eventual development of the electrical business under regulation must proceed under or along some such lines for the proper reward for such leniency.

As I stated, the general tendency of the commissions in the cities, in attacking the rate problem is to talk a maximum rate and consider and think a maximum rate. You very rarely find a commission looking at the rate problem from the standpoint of what, under the rate, the average consumer of a certain class is receiving. What we have attempted here is to pick out a certain residence customer and for a period of one year, and calculate what each one of these customers would have to pay if he lived in these various cities.

Now, there is a surprising difference between the maximum rate and the average rate. The most striking instance is that of Detroit where the maximum rate is 13.4 cents. On the other hand, the average under this rate in Detroit is 5½ k. w. hour, so that while Detroit has the highest rate, it is one of the lowest average rates of any city in the country.

The residence consumer was picked with these characteristics and the actual bill for a period of one year was figured out under all the rates.

Inasmuch as I have made some criticism of commissions and their methods of rate regulation, it seemed to me to be rather up to me to go back just a little and square myself on the general subject of rate regulation, especially as the matter of regulation by State Commissions is a subject that is important at this time in the state of Illinois.

(*Continued on page* 134)

Shows How Public Service Gas Company's Industrial Department Views its Responsibilities

L. C. F. Horle Narrates a Few Instances Which Reveal Multiplex Problems Industrial Representative Must Cope With

How many of us who are Public Service representatives realize what responsibilities the name public service puts upon us, and how much we owe the public through our mere connection with our company? asks L. C. F. Horle in an article in the July issue of *Service*, issued by the Public Service Gas Company of New Jersey.

We may discharge this obligation in many ways, and these ways may range from politeness over the telephone, where we are often tempted to allow our much-tried patience to lose itself, to the solving of more or less technical problems with no immediate profit in view.

While the more insignificant of these are fully as important as the greater ones, it is the bigger problems and those more difficult of solution that are the more interesting.

Along this line it might be of interest to mention some of the problems that the industrial fuel representative must solve in his daily work, not as a means always, of selling gas or gas appliances, but merely to discharge the responsibility he has assumed as a representative public service man.

Recently our industrial representatives were called upon by a manufacturer of small glassware, who had purchased a furnace from us, to investigate the cause of the high breakage in his finished product, which happened to be pressed glass rod cocktail mixers. On looking into the matter it was found that his gas-burning appliance, which in this case was a simple oven furnace, was operating quite satisfactorily, and that the difficulty did not lay in this direction. The representative assigned to the job didn't stop here but proceeded to get at the root of the trouble. He found the glass rod stock had not been properly annealed, and that the finished mixer was not being cooled slowly enough. On learning this he made recommendations which caused the manufacture of glass to be more perfectly satisfactory.

Very similar to this was the case of a Newarker who has patents on a method of making leaded glass windows and panels, which gives a product far superior in strength and beauty to the old-fashioned, heavy and easily broken panel. The Industrial Fuel Department was called upon to aid in making this process practicable and soon submitted sketches of the apparatus needed, which is now being built by the prospective manufacturer.

Along the same line this department has devised special methods and apparatus for making porcelain to replace the no longer obtainable German porcelain, for annealing nickel wire, which is also replacing the German product. It has recommended and had installed, improved methods and apparatus for fine metal treatment in the manufacture of mesh bags, for the manufacture of rubber toy balloons, for the making of automobile parts, for the cleaning of drop forged powder can tops, the manufacture of toilet preparations, etc.

The industrial fuel representative does everything from designing special apparatus for special work, and devising special methods for doing regular work, to suggesting locations for new plants and helping old plants re-locate in newer and better quarters.

Gas Producer Installed on Harbor Boat Shows Fuel Economy

A practical demonstration of the economy obtained by the use of the Galusha gas producer, manufactured by the Nelson Blower & Furnace Company, of Boston, was given to a group of newspaper men and representatives of manufacturing firms recently, when they were taken for a harbor sail on board the harbor boat, the B. G. Purdy, the only boat in the north Atlantic Ocean equipped with a gas producer.

The B. G. Purdy is a combination water boat and tug of average length and weight. Installed in her engine room is a Galusha gas producer which produces gas from anthracite coal. This gas is the fuel which is consumed in the engine.

During the entire trip only 280 pounds of coal were burned to furnish power through the gas producer, according to the figures of the engineer and Arthur W. Fonda, sales manager of the Nelson Blower & Furnace Company, who was in charge of the trip and demonstration.

The coal cost just $1.12, which was the entire cost for fuel to drive the B. G. Purdy over the 25 miles.

If the boat had been driven the same distance with gasoline furnishing the propelling power it was estimated by experts aboard that the cost would have been approximately $12.

If bituminous coal had been used for steam for the same trip the cost for fuel would have been approximately $9, according to the figures of the same experts.

Average propeller revolutions per minute were 290.

Patents Pertinent to Gas Industry

Regenerative Furnace Equipped with Several Heating Chambers

Patent No. 1,222,690; described in Patent Office *Gazette*, April 17, 1917, page 666. Horace E. Smythe, Pittsburgh, Pa., assignor to The S. R. Smythe Company, Pittsburgh, Pa. Filed May 15, 1915. Serial No. 28,333. (Cl. 158-7.5.)

This regenerative furnace is composed of a furnace chamber with a regenerator beneath. A preliminary combustion chamber is alongside of the regenerator. The gases are conducted to the preliminary combustion chamber, and partially regenerated air is also conducted to the preliminary combustion chamber. The burning gases are conducted through passages to the furnace chamber, and passages likewise conduct fully regenerated air to the combustion chamber for perfect combustion.

Coal Handling Machinery Provided with Adjustable Conveyor

Patent No. 1,222,286; described in Patent Office *Gazette*, April 10, 1917, page 481. William Edward Hamilton, Columbus, Ohio. Filed May 2, 1914. Serial No. 835,841. Renewed Mar. 8, 1917. Serial No. 153,463. (Cl. 193-3.)

This device consists of a main frame, provided with guide ways, with vertically adjustable bearing blocks slidable thereon. A driving shaft is journaled in the blocks, and a boom is pivoted on the shaft. An endless conveyor is mounted on the boom, the conveyor being operated by the shaft. A receiving trough, with delivery hopper and outlet gate, is attached to the boom.

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A Permanent Market for Benzol

Hours of discussion have been devoted to the possibility of finding a market for the immense quantities of benzol gas companies may be producing at the end of the war. This cannot but be valuable and beneficial. It sets many minds to thinking along constructive lines.

Some speakers are optimistic in their viewpoint; others pessimistic. That of the AMERICAN GAS ENGINEERING JOURNAL may appropriately be styled fatalistic.

The very men who are worrying most about the future market are the men, who, if their companies find themselves with extensive benzol plants on their hands at the end of the war, are going to find a market for the output. This is as certain as fate.

The possibilities of human initiative are boundless, and in the past the gas industry has been notable for finding a use for by-products for which there was apparently no market. It must be remembered that there was a time when gas companies even went to the expense of digging holes in the ground to get rid of their tar.

If the gas industry goes into the business of producing benzol to an extensive degree to help the Nation over a temporary need, the production of benzol on a broad scale will become a permanent part of its business after the temporary need has passed.

There will be few benzol plants dismantled. There may be, however, a large number enlarged.

The obvious market for benzol in peace-time conditions would seem to be as a motor fuel in place of gasoline. Such a market, we may be assured, would not be obtainable without contest. Though the country's petroleum resources are rapidly becoming restricted, the big oil interests under conditions as we can see them now, would fight bitterly any encroachment upon the gasoline market. But these conditions may change. The demand for motor fuel may surpass our wildest speculations.

The airplane may emerge from the war an immense commercial actuality. It is not inconceivable that developments along this line may progress with such rapidity that, promptly upon the cessation of hostilities, airplane postal services, at least, and possibly even passenger and freight services will be spread all over the country. Hundreds of thousands of men will have learned to drive the machines and to travel in them without fear. It is possible even that the airplane will rival the automobile as a pleasure conveyance within a decade after the war.

The motor truck is another machine upon which the war has stimulated improvements. Use will have to be found for thousands of these now in military service, and the finding of these uses will inevitably lead to the need and construction of thousands more.

The need of motor fuel may conceivably be such as to tax not only the gasoline-producing industry but the benzol-producing branch as well.

But even if these things do not come to pass there is still no need to despair of a market for vast quantities of benzol. In many cities there are motor bus lines and large taxicab companies, many of them immense undertakings. Possibly it may be found mutually beneficial for gas companies to enter into long-term contracts with such companies for their entire output and not rely upon the open market. Conceivably gas companies may even go into such businesses themselves to find a use for their benzol.

This latter does not seem possible to us now, according to our present ways of thinking, but he would be a vain man indeed who would venture to say what may or may not come out of so great a war.

The Industrial Gas Representative and Prospects of Direct Sales

Elsewhere in this issue we publish a brief abstract of an article in *Service*, issued by the Public Service Gas Company of New Jersey, which in the opinion of the AMERICAN GAS ENGINEERING JOURNAL reveals a very sound policy in developing the industrial gas field.

An instance is cited in which the company's industrial man was called into consultation by a manufacturer, who was using a gas oven furnace, in regard to excessive breakage in his finished product. The gas equipment was carefully examined and found in perfect working order. At this point, it might be thought by some, the gas man's responsibility ended. But not so with this industrial representative. He studied the manufacturer's working methods, discovered the source of the difficulty and advised as to remedying it.

That required that he be something more than a gas man, specializing exclusively in the fundamentals of gas-burning equipment. The service he rendered was that of an industrial engineer when taken in the general sense.

Also the article states: "The industrial fuel representative does everything from designing special apparatus for special work, and devising special methods for doing regular work, to suggesting locations for new plants and helping old plants relocate in newer or better quarters"—in other words, as indicated in the instance cited, rendering a general industrial engineering service.

This is a broad task and would seem to require an exceptionally broad man. The AMERICAN GAS ENGINEERING JOURNAL has consistently contended that it is only by employing such men that the industrial fuel gas branch can be properly developed.

If gas is to find the market in the industries its merits as a fuel entitle it to, the gas industry must have in its employ men who are experts in the particular industries, not merely gas men. To obtain them it may have to pay salaries that will upset all previous standards, but the investment is most certain to bring big returns.

Rates of Pay

It is probable that the rates of the majority of gas companies will be materially raised as a consequence of high costs of operation and materials, and it is inevitable that the wages of employees will also have to be raised to enable them to meet the excessive costs of living they are contending with.

It is to be hoped that when the period of readjustment comes that new permanent wage standards will be set for the latter.

The gas industry is an old industry. It is but natural that in certain spots old-fashioned ideas should prevail in regard to particular matters. Thirty years ago, perhaps less, a hundred-dollars-a-month salary was considered a fair compensation even for a rather exceptional employee. The costs of living changed with the passage of years, but the viewpoint as to the compensation this or that task merited did not always change with them.

Then, perhaps, there came a rate adjustment. A valuation, more or less equitable, was made, operating expenses—on the basis of inadequately paid employees—were taken into consideration and a scale of rates determined. After that possibly there was a skimping on the part of the company so it could exist and pay a return on its investment under, perhaps, an inadequate rate scale. It is possible that this process was gone through several times; the salaried employee meanwhile paying a good part of the bill.

The House Heating Situation

As the months pass and we approach fall and winter, no evidence is apparent that any considerable relief is to be expected in the matter of coal supplies for domestic purposes.

It is a known fact that during the past winter many companies could have sold a much larger number of gas heaters than they did sell, had they been obtainable within a reasonable period. The prospects are that the market for such appliances, if there is not a very considerable improvement in the domestic coal supplies situation, will be even better this winter. There are a very large number of householders, even in these torrid days, who retain very vivid memories of unpleasant days of inadequate heating in the chill of last winter.

Gas supply is regular and consistent. The public knows this, and, even though the cost is greater it has come to look with partial eyes upon it for house heating.

In the opinion of the AMERICAN GAS ENGINEERING JOURNAL it would be the height of wisdom for gas companies to make inquiries of the manufacturers of gas-heating equipment and appliances as to what they may expect from them in the way of deliveries and price trends, and to make provisions against a failure to reap the maximum benefit from what might be termed this somewhat forced era of gas house heating.

(*Continued from page* 130)

History of Regulation

Regulation began in 1885 in Massachusetts; when the gas commission was there started in 1885 it was changed to gas and electric light, and regulated practically no development until 1897, when New York and Wisconsin both established laws, the theory of which was based on the Massachusetts practice, but both Wisconsin and New York laws were better than those of Massachusetts and were founded upon the practice of Massachusetts rather than the actual wording of the laws.

Georgia, in 1907, established a regulation law, and the powers were given to the rate commission but they practically did little with them until three or four years later. Nebraska gave regulation of stocks and bonds of electrical and gas utilities to the railroad commission in 1907, but have not since then increased their jurisdiction. In 1909, two years later, there was comparatively little change. In Oklahoma there was some regulation which is still incomplete.

Michigan gave its rate commission a right to regulate stocks and bonds and rates of electric companies, only. Vermont passed a law in 1909 which started the commission in that state. In 1911 we see that the Pacific Coast came into line, with California, Nevada and Washington. Kansas also came in, with Ohio, Maryland, New Jersey and Connecticut and New Hampshire.

The Ohio law was a more or less defective law, and it was changed in 1913.

There was still more progress in 1912 on the Coast and Oregon, Arizona and New Mexico came in, as well as Rhode Island.

The most fruitful year was 1913, when Illinois, Missouri and Colorado passed a law which became effective in 1914. Wyoming, Montana, North Carolina, West Virginia, Indiana and Pennsylvania and Maine passed a law which became effective in 1914.

There was no development of any note worthy of mention in 1914.

Just one word about state and local regulation: I am a firm believer in state regulation. I believe that state regulation should be maintained in Illinois, and that the state commission should be strengthened and improved and given complete jurisdiction, and my reasons are not sentimental, but it has always seemed to me that anyone who carefully considered the principles involved in regulation could come to no other conclusion, but that state regulation was preferable to local regulation, or the so-called Home Rule.

If you first take it up on the mere question of territory covered—the railroad and express companies are, of course, inter-state, and in fact, some railroads, like the Michigan Central and the Grand Trunk, are international.

Our electric railroad rates are never—with rare exceptions—a purely local proposition. Our electric companies are fast outgrowing the local situation. The service of a big, modern generating system spreads over a vast territory and proper regulation of such companies means that it must be controlled by a body with broader powers than those which any city power possibly can have.

Gas, it is true, is a little more local, but even the gas companies are extending beyond the city limits, to the territory beyond and the limitations of a gas company in a single city are not important.

Even in the case of water, which is municipal generally the source of the water supply is outside of the city, and telephone, of course, is state or interstate.

Therefore, on the mere matter of territory covered, the utility regulation problem is too big and it is too involved a problem to be handled by any one city, and it is important to know that here in Illinois we are proposing to step—or some of the people are proposing to step backward from state regulation at the very time when the railroads are making a great effort, and most railroad economists are realizing that the grouping up or splitting up of the regulation of the railroads, into various commissions is a very serious error, and it is more than likely that in a very few years we will have our railroads entirely under federal jurisdiction; and at a time when the economists are all coming to the point of single jurisdiction for the railroads, here we find in this state, an attempt to step backward for the other utilities.

Competition

Now, when we attempt to analyze the functions of regulation, the most important is the subject of competition. In every city in the Union, the matter of competition and the question of necessity are state functions. The experience of regulation, and especially in the states of early regulation, have shown that the cities are not really competent to pass on the question of whether competition is necessary or not, and all authorities agree that the matter of regulation is a matter for the state.

The second item is that of capitalization. The utility corporation itself is a creature of the state. The regulation of its capitalization is a state function, and as I understand it, from some bills that have been proposed, it is even proposed to take that away from the state commission.

Now we come to the question of the matter of rates. That is the most disputed point of all, of course, but when you come to carefully analyze the average state regulation you find that it is a controversy which exists, not between the consumers of the company and the company, but it is a controversy which exists between the city and the company.

Now, such a controversy should be settled by arbitration, and to get fair arbitration we must have some board of arbitration that is not one of the parties. As someone once expressed it, it would be just about as fair if all the disputes between capital and labor were arbitrated by a committee composed entirely and appointed by labor, as if our rates, which are fundamentally a controversy between the city and the companies, were to be regulated by the city alone.

In the same way accounting is a proper state function, and one of the great necessities of accountants is to get a proper form of accounts, and uniform statistics we get from our accounts. Now, of course, commissions in the various cities throughout the state cannot be relied upon to make our accounts uniform, and our statistics would be valueless, so that from all points accounting is a state function.

The only function which is a city function is the question of service and the question of extensions, and yet in actual experience in such states as Wisconsin, where franchises require service and the regulation of the service, it has been found that most of these rights of the cities held by the cities were never exercised and the real regulation of service, and the real regulation of extensions did not begin until there was a state-wide commission.

News of the Gas Industry

Technical School Students Subject to Special Consideration in Draft

Students in engineering courses at universities and technical schools will be subject to special consideration in the execution of the draft law, by authorization of the secretary of war, according to information received by C. R. Richards, dean of the college of engineering of the University of Illinois, from P. P. Claxton, United States Commissioner of Education.

At the request of Mr. Claxton, Dean Richards will claim exemption for all students who show promise of success in the various engineering lines. The successful prosecution of the war, Mr. Claxton wrote, depends in a large measure on the skill and numbers of the engineering corps. With the conclusion of the war, he adds, the work of rebuilding the industries of the country will be more important than ever.

"The war in Europe," he said, "has been a war of engineers and of the products of engineers. Every effort has been made by the European powers to conserve and increase the supply of such men. The demand for graduates of engineering schools in this country for the last few years has been far greater than the supply, and as a consequence of this many of the most important industries have been seriously embarrassed."

Mr. Claxton has appealed to the heads of all technical schools to seek exemption for their engineering students on this account.

Rate Increase at Middletown, Conn.

The Middletown Gas Light Company of Middletown, Conn., announces that because of the increase in the price of its two most important items, coal and gas oil, it will be compelled to increase its rates 20 cents per thousand cubic feet, to go into effect on bills rendered September 1, 1917. This increase, however, will only partially compensate for the increased cost of labor, pipe fittings, and almost every item in connection with the manufacture and distribution of gas. The company hopes that the above increase will be only temporary.

Consolidated Gas Company Forms Back-Bone of Far-Reaching Plan to Conserve Food In and About New York City

Government Agricultural Experts Aid Gas Company in Biggest Educational Exhibit of Its Kind—Demonstrations and Lectures at Company Display Rooms Meet With Exceptional Opening Success

The Consolidated Gas Company, of New York entered upon the campaign for preservation and conservation of food in real earnest Monday, August 6, with the opening of its Government Exhibit, occupying the entire second floor of their recently completed building, No. 212-218 West Fifty-seventh Street, New York. Prof. F. Lamson Scribner, chief of the Agricultural Departments, Bureau of Exhibits, is to take general charge of the display. He is assisted also by Mr. Ormsby, his chief assistant, and O. H. Benson, chief departmental expert on food dehydrating, canning and preserving.

Mr. Benson, several days before the exhibit opened, was lecturing and demonstrating in the Fifty-seventh Street building on these topics before a large class of women recruited by the Consolidated company.

These women, when qualified, are to qualify other demonstrators, so that in a few days there will be free demonstrations daily in all of the various gas offices tributary to the Consolidated in Manhattan, the Bronx, Westchester County and Brooklyn. The public will be invited to all of these demonstrations.

A carload of exhibits from the Department of Agriculture, including dehydrating apparatus, as well as many of the most instructive cabinets displayed in the San Francisco Exposition, have been arranged in place at the showrooms in the Fifty-seventh Street building.

Monday, the Opening Day

Monday, August 6, the opening day, was a complete success. More visitors arrived than were expected, and the campaign was given an exceptional send-off.

Music was furnished by the orchestra composed of workmen employed in the gas company's meter repair shop, who volunteered their services for the occasion.

While the main exposition remains open in the West Fifty-sev-

New Chicago Rate Accepted and Put Into Effect

The Peoples' Gas Light & Coke Company of Chicago, on Aug. 1, notified the city of Chicago of its acceptance of the new gas rate ordinance passed by the city council on July 25 last, and at the same time put into effect the reduced rates resulting from the ordinance.

The new rates follow: 30 cents per month minimum bill, including 350 cu. ft. of gas; 70 cents per 1,000 for the next 9,650 cu. ft. per month; 65 cents per 1,000 cu. ft. for the next 40,000 cu. ft. per month; 40 cents per 1,000 for all gas in excess of 50,000 cu. ft. per month.

With the application of the new rates the company automatically lowers the British thermal units of the gas from 600 to 565. The old rate to small consumers was 90 cents per 1,000 with a discount of ten cents per 1,000 ft. for prompt payment of bills. The company announced also it would furnish free of charge two junior mantle gas lights to every consumer who heretofore had been using flat burners.

The Boston Consolidated Gas Company's industrial fuel department has added another gas cooking equipment to its mains. This time it is the Boston Athletic Association and consists of a complete outfit.

enth Street building canning, preserving and food drying demonstrations will be given there daily, except Sundays, from 11 o'clock in the morning to 1 o'clock in the afternoon and from 2 to 4 o'clock in the afternoon. Among those who have taken an active part in the preliminary training of the large number of prospective demonstrators within the last few days are Miss Hooker, who is the leading woman demonstrator of the Department of Agriculture, and Miss Van Rensselaer and Miss Lucille Brewer, both of the New York State Agricultural College, at Ithaca, who have been closely identified with the educational movement now in progress throughout this State with the aid of a demonstration car operated over the lines of the New York Central Railroad.

Professor Scribner said he regarded this as the biggest thing the department has yet undertaken in the way of educational propaganda on the conservation of food products, as it was established for a period of four or five weeks, at the moment when it is most vitally needed, a metropolitan headquarters from which would be radiated practical information and instruction to the rest of the country.

Acknowledging the Consolidated Gas Company's proffer of the use of its new building, Secretary Houston, of the Department of Agriculture, wrote to the officers of that corporation:

"In response to the President's appeal large quantities of fruits and vegetables have been produced in many areas and it is highly important that every effort be made to provide for their effective utilization and conservation. The department, therefore, is very glad to have an opportunity to demonstrate to the people of New York methods of utilizing and conserving such products by canning, preserving, drying and the like. I am sure that the demonstrations will prove of great interest and I hope it will be understood that everybody interested is personally invited to visit the exhibition."

Red Tape Eliminated

To insure the inauguration of the educational campaign at the moment when it is most needed and to evade delays incidental to departmental red tape in the obtaining of appropriations, the Consolidated Gas Company bore the expense incident to the transportation of the carload of exhibits from the capital and agreed to defray the expenses of the Government experts engaged in the work while in New York.

Government Exhibits Described

Apart from the demonstrations of dehydrating and like processes, the broad and interesting scope of the Government exhibits to be shown in the West Fifty-seventh Street building is indicated by this synopsis prepared by Professor Scribner:

Exhibits from Bureau of Animal Industry.—Meat inspection, model milk house, the story of clean milk, model poultry house and selected eggs for the market.

Bureau of Plant Industry.—Cereal investigations, plant diseases and results of spraying, rice display, selected samples; corn display, selected samples.

Bureau of Chemistry.—Egg testing and incubator, charts and samples of baby foods; insecticides and fungicides, charts of patent medicines, etc.; dried fruits and vegetables.

Bureau of Entomology.—Specimens of insects of garden and orchard, spraying and other devices for destroying insects—insects that affect the health and comfort of man, insects injurious to corn and wheat.

States Relations Service.—Canned fruits and vegetables, prepared corn foods, variety and quantity of food for a family of children, luncheons for school children, luncheons for laborers, care of foods; saving that there shall be no waste; maps, charts, photographs, etc.

Bureau of Markets.—Model of ship with hold filled with corn, illustrating approved methods of stowing cargoes of cereals for shipment abroad; photographs showing methods of handling grain in bulk.

Arrangement of Window Displays

On the ground floor of the West Fifty-seventh Street building the Consolidated Gas Company has arranged to have a window display, showing canned goods, including fruits, vegetables and meats; dried foods, including fruits and vegetables; Indian corn foods in variety; enlarged photographs showing canning operations, home vegetable gardens and the like; illustrated posters applied to the conservation of foods, increase of food productions, etc.; bulletins of the department on practical methods of canning and drying foods, suggestions for saving in the kitchen, and economical ways of supplying the table and feeding the family.

With the object of stimulating public interest in the preservation of foods by simple and economical methods, the Consolidated Gas Company is considering the preparation of similar window displays in the various gas offices scattered throughout Westchester County, in Yonkers, White Plains, New Rochelle, Peekskill and elsewhere.

Gas Company Declines to Supply Balloonists

During the last several weeks the Pittsfield Coal Gas Company of Pittsfield, Mass., has turned down offers from balloonists, who wanted to come to that city for ascensions, the reason for the action being that the company is doing all it can to supply local consumers. When asked abut the situation Manager H. C. Crafts explained:

"The Pittsfield Gas Company has had several inquiries about gas for balloon purposes, but on account of the difficulty in getting material and since the old ballooning days the output of gas has increased so much it is impossible to devote time to making balloon gas without affecting the gas supply to the regular customers in this city, who have always been first to be considered by the company."

Manager Crafts said he could not say a thing about the price of gas or whether it would be increased or not. This will not be decided until reports are submitted in the annual meeting and the company will give the public ample time to prepare, in case there is to be any change in the prices.

Manager Crafts is of the opinion that the consumers are not likely to be called upon to pay more for gas. A method similar to that of the Pittsfield Electric Company in reducing the discount may be asked, however, if the company is forced to it, he said.

Expect Increase in Rates at Lorain, Ohio

The Citizens' Gas & Electric Company issued a statement that due to the increase in cost of production it will be inevitable that an increase in rates be charged consumers in Lorain, Ohio.

The people in Lorain are paying the company 33 cents per 1,000 cu. ft. Under the terms of the franchise the company might charge a maximum of 39 cents.

United Gas Improvement Company Stimulates Canning and Preserving Campaign by Booklet Entitled "Prepare"

First Edition of 55,000 Snatched Up Through One Newspaper Advertisement Appeal

In an effort to co-operate with the food preservation desires of the government and the wide-spread campaign of the National Commercial Gas Association, the United Gas Improvement Company of Philadelphia has issued a most complete booklet dealing with information on canning and preserving.

The first edition of 55,000 has been distributed and the interest among the consumers is so great that another now appears necessary. This edition was all disposed of as a result of one newspaper advertisement in the Philadelphia papers, copy of which is reproduced herewith.

It will be noted that a reproduction of the cover of the booklet is shown in the advertisement, together with some copy describing the booklet and referring to the advantages of the gas range in the work of canning and preserving.

The plan was to depend upon this publicity to induce people to come to the offices of the U. G. I. Company and ask for copies of the booklet, also to make distribution by mail and through the medium of their representatives on the streets and their force of instructors.

This plan worked admirably, so well in fact that it was not necessary to repeat the advertisement. In addition to the city requests, over four thousand mail requests were received from outside of Philadelphia, and in many cases stamps of various denominations were enclosed, notwithstanding the fact that they advertised that the book was free. Copies were sent to all of these out of town persons, feeling inasmuch as the proposition was a patriotic one, in addition to its business character, that they should not deprive any interested person of the advantage of owning a copy.

In issuing this booklet they made their plan tie up with the broad propaganda of the National Commercial Gas Association. They used the posters supplied by the association, and in their window displays and other forms of publicity carried out the association's ideas.

GET YOUR COPY!
FREE
"Prepare" is the title of a valuable book which we have issued to aid in the patriotic work of
Canning and Preserving Fruits and Vegetables
It will show you how to Prepare against food shortage by Preparing appetizing canned fruits and vegetables, preserves, jellies and jams for your table next Winter. All the newest methods, such as drying vegetables and fruits in the gas range, cold pack process, etc., described in detail, so that you should have success even without previous experience.
Thirty-two pages of recipes and instructions. Thirty illustrations making clear every process described. A series of gummed labels for marking your jars and glasses.
You can get best results at least expense by using the gas range for canning and preserving.
The edition of the book is limited. While it lasts we will give one copy free to each adult person calling at any of our offices, or will mail you a copy if you send us your name and address on a postal.
The United Gas Improvement Co.
Broad and Arch Streets,
Broad and Tasker Streets,
1706 N. Broad Street,
135-37 S. 52nd Street.
5534 Germantown Avenue,
4419 Frankford Avenue,
2209-11 N. Front Street,
4236 Main Street, Manayunk.

NEWSPAPER ADVERTISEMENT THAT DISPOSED OF 55,000 BOOKLETS WITH ONE INSERTION

The cover of the booklet is an oil painting, which was made by Clarence C. Snyder, a Philadelphia artist. The reproduction is in four colors. It will be noted that on the cover a kitchen scene is shown with vegetables both fresh and canned. They selected vegetables instead of fruit, feeling that this year the interest of the housewife would center on vegetables more than in other years, due to the requests of the government that the vegetable crop should be preserved.

On the back cover they showed a vegetable garden with fruit trees in the background.

The other features of the book which deserve particular attention are the series of gummed labels included, and the marginal cuts illustrating the various processes that are described. Both of these features

have proved very acceptable to their customers.

The book is thirty-two pages, exclusive of the cover and the gummed labels, and the copy begins with a foreword written in a patriotic style and quoting from Secretary Houston, of the Department of Agriculture, the words, "Women can do most in food conservation by preventing waste." Following this the advantages of the gas range in canning and preserving are referred to briefly and there is also an invitation to their customers to call on their instructors to help them with this work.

The chapters of the book are as follows:

Preliminary Preparation — First Principles, Care of Jars, Glass-top Jars, Screw-top Jars, Sterilizing Jars.

Vegetable Canning—General Rules, Preparation, String Beans and Asparagus, Peas, Lima Beans and Corn, Canned Whole Tomatoes, Canned Spinnach, Canned Dandelions, Beet Greens and Swiss Chard, Canned Beets, Carrots and Turnips, Open Kettle Cooking, Tomatoes and Corn Canned Together.

Dried Vegetables—Preparation.

Fruit Canning—Oven Canning, Classes of Fruits, Canning Soft Fruits, The Thin Syrup, Berries, Cherries, Strawberries, Peaches and Plums, Blanching, Hard Fruits, Quinces, Currants and Raspberries.

Canning Fruit Without Sugar—Rhubarb, Blueberries, Cranberries.

Preserving—Sugar, Small Fruits, Peaches, Plums, Nectarines and Apricots, Ginger Pears, Quinces.

Jams and Marmalades—Economy in Making Jam, Small Fruits, Large Fruits, Raspberry and Currant Jam, Strawberry and Rhubarb Jam, Pineapple and Strawberry Marmalade, Quince Marmalade.

Jelly Making — Pectin, Fruits Lacking Pectin, Strawberries, Peaches, Cherries, Blueberries and Pears, Proportions for Jelly, Thin Jelly, Currant Jelly, Gooseberry, Grape or Raspberry, Crab Apple, Peach, Quince, Oriental Jelly, Fruit Butters.

Conserves — Pineapple Conserve, Mixed Fruit Conserve, Peach Conserve, Carrot Conserve.

Following this is a list of their offices and showrooms in Philadelphia with the telephone numbers.

They have heard many favorable comments from their customers on this book and feel that it is helping tremendously to increase the use of the gas range this summer.

Salt Lake City Employees Enter Into Labor Agreement for One Year

Officials and employees of the Utah Gas & Coke Company have signed a working and wage agreement highly advantageous to the latter. The pact covers the next twelvemonth, and guarantees freedom from labor difficulties at the plant of the company until its expiration.

The provisions of the agreement, as outlined and signed by the gas company officials, afforded a voluntary display of liberality which constituted a pleasant surprise for the employees. An eight-hour day with the full pay of the nine-hour day that has prevailed in the past was granted. In addition, time and one-half will be paid for all emergency work requiring temporary extension of the eight-hour limit.

An important feature of the agreement is an arbitration clause, under which the company agrees not to lock out the employees and the employees not to strike without first having obtained a verdict on all matters in dispute from an arbitration board comprised of three men—one of whom is to be selected by the company, another by the complaining employees and the third by both parties to the contention. Governor Simon Bamberger urged the acceptance of the arbitration clause and expressed pleasure when notified of its adoption.

William M. Knerr of the state industrial commission obtained a temporary adjustment of difficulties between the management and employees of the Utah Gas & Coke Company two months ago, when a strike at the plant of the company appeared imminent. The agreement reached at that time was only verbal, and misunderstandings followed. The management requested Mr. Knerr's assistance in drawing up a written compact covering one year, to be signed by representatives of the company and of the employees at the company's plant. Mr. Knerr responded immediately to the call and formulated an agreement draft in the afternoon. It was finally accepted.

THE PEOPLES' GAS LIGHT & COKE COMPANY, Chicago, has added a new section to its basement salesroom, the goal of which is to place an incinerator in every home in Chicago.

Doherty and Armour Oil Interests Merge

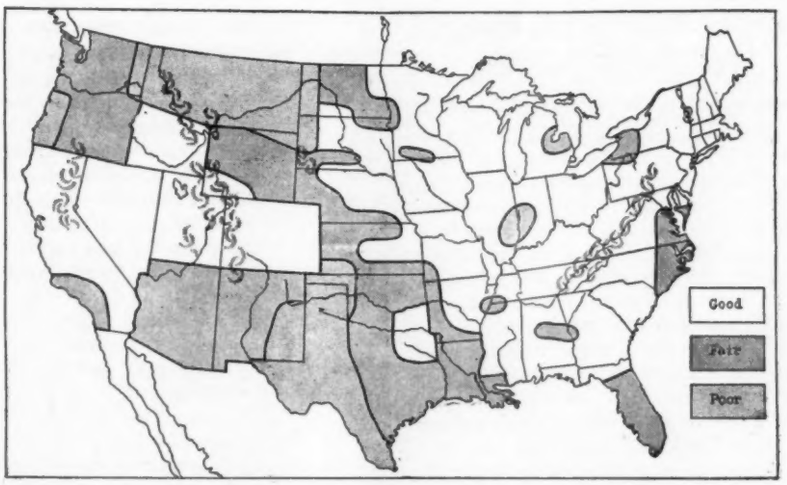
A merger of the oil interests of the syndicate headed by J. Ogden Armour of Chicago, with those controlled by Henry L. Doherty & Company of New York, was announced recently. This was brought about by Cities Service Company purchasing the Armour Refinery at Independence, Kan., payment being made in Cities Service Preferred Stock, which is to be retained by the Armour Group for a period of years. The Armour interests have also invested by a further purchase of Cities Service Preferred Stock, enabling pipe line extensions from the refinery to the Doherty oil holdings in Kansas. The Independence Refinery has a daily capacity of 3,000 barrels, and owns a pipe line to the field in Nowata County, Oklahoma, where the Doherty Company also has production.

Cities Service interests have also bought the oil leases on 101,000 acres in the Eastern Kentucky field from the L. G. Neely interests of Ohio. The present production in this field is 1,500 barrels daily, selling at $2.23 per barrel. Other interests are in this field, known as the Irvine, notably the Ohio Oil Company, a Standard Oil subsidiary.

By this purchase the Doherty interests, represented by the Empire Oil & Gas Company, absolutely control 65,000 of this 101,000 acres, with partial interest in the remainder. This includes a 55,000 barrel storage tank and a 10 mile pipe line from the field to Irvine, Ky., where there are transportation facilities by rail, water and pipe line. The total leased acreage in this field of the Empire Oil & Gas Company now becomes 148,000 acres.

Strong Gas Well Found in Iowa

The strongest flow of gas ever found in Iowa rewarded the efforts of the Interstate Gas & Oil Company when it completed a well on the Anton Leber farm near Herndon, Ia., a few days ago. The boom is again on at Herndon and the officers of the company are jubilant, for they feel that their work has been a success. Gravel, rock and sand were thrown over 100 ft. in the air and the roar which accompanied the striking of gas was terrific. Considerable excitement prevails in the community.



GENERAL CROP AND BUSINESS CONDITIONS AS REPORTED BY COMMITTEE ON STATISTICS AND STANDARDS, CHAMBER OF COMMERCE

Backyard Cultivation Did Its Bit in Making Recent U. S. Products Report So Promising

Not only are abundant crops promised in a report just issued by the Committee on Statistics and Standards of the Chamber of Commerce of the United States, but it goes on to say a "most encouraging and significant feature of the situation is the general confidence of the business world in the future, the large volume of business, and the generally sustained conduct of commercial activity in the midst of war's alarms and a future which is beyond any man's ken."

The accompanying map shows the general prevailing conditions throughout the country and when backed up by the report which shows a promising outlook for almost every crop and industry, the conclusion is that we cannot help but be hopeful.

The innumerable gardens and cultivated back lots have produced an output of vegetables of unexampled volume. As a result of this new industry, there are being shipped weekly to the large markets thousands of carloads of early vegetables and fruits. The real difficulty in many cases is finding an adequate market at remunerative prices for much of this product.

Increased Output by Boston Company

The July output of the Boston Consolidated Gas Company was 402,681,000 cu. ft., an increase of 11.9 per cent over July, 1916.

State's Right to Fix Gas Rates Is Upheld by Oklahoma Supreme Court

The right of the state commission to fix rates for gas, electricity, water and other public service, regardless of the rates granted by franchise to corporations, was upheld by the supreme court at Oklahoma City.

The opinion was given in the case of the city of Pawhuska against the Pawhuska Oil & Gas Company, an appeal from an order of the state corporation commission. Pawhuska by a franchise to the company had fixed a rate for gas and provided for either a flat rate or payment by meter. The commission fixed a higher rate than that in the franchise and provided that gas should be charged for only by meter.

Government to Buy Gas Company Land

Shareholders of the Pittsfield, Mass., Coal Gas Company were notified that a special meeting was to be held in the office of the Pittsfield National Bank, Aug. 6, at 11.30 a m., to act on the following articles:

To authorize the sale to the United States of America of about 424.12 sq. ft. of the company's land lying on the north side of Federal Street, for the consideration of $1,357.18.

To authorize the treasury of the company to execute a deed of this land from the company to the United States of America for the consideration named in the above article.

Benzol and Toluol Markets

Large quantities of benzol are piling up in storage warehouses awaiting shipment to Europe, the scarcity of bottoms making it impossible to ship consignments which heretofore have been going on regular monthly specifications. The same situation holds true with regard to phenol and picric acid, and there is no relief in sight. Producers of benzol are sold for many months ahead on contract, and prices remain firm on the basis of 55c. to 60c. per gallon for the pure.

The United States Government is taking practically the entire toluol output of the by-product ovens, and this product is being shipped as rapidly as present conditions will permit to plants where it is made into trinitrotoluol. This Government is supplying the needs of its allies for trinitrotoluol. The price to the Government is $1.50, but on private contracts and in re-sale lots for shop shipment it brings from $1.75 to $2 per gallon.

The sulphate of ammonia market is firm, fertilizer manufacturers having contracted for many months ahead.

Company Asks Higher Rate When City Asks for Lower Rate

The most important rate investigation in Richmond, Cal., since that recently held over the rates of the East Bay Water Company, promises to be the one now started by Richmond into the charges made for gas service in the city by the Pacific Gas & Electric Company. The city carried its rate complaint before the State Railroad Commission.

When the city asked for a rate of 90 cents, similar to that charged in Oakland, Berkeley and Albany, the gas company retaliated by asking the commission for permission to raise its rates to $1.35. At the present time Richmond gas users are paying $1.25 per thousand.

The hearing was continued over until August 20, at which time it is thought a general investigation will be started into the gas rates in all the bay cities. Officials of the gas company refused to answer City Attorney D. J. Hall, when he asked if the proposed raise to $1.35 would be made for all the east bay cities.

A claim was made by the gas company that all materials which it uses in producing gas are much higher and that it will soon be forced to ask a better rate than it is now getting.

Decision in New Jersey Heat Standard Case Reserved —Dispute Involving Rates

At the final hearing to-day before the public utility commission on the application of the Public Service Gas Company and numerous South Jersey gas companies for permission to reduce the standard of their product, now being served consumers of the state, opposing counsel became involved in a dispute as to whether the application was or was not really one involving the fixing of rates. The utility board took the application under advisement and reserved decision. The gas companies are asking for the lowering of the standard on the ground that the cost of materials used in the manufacture of their product has been greatly advanced.

L. D. H. Gilmour, presenting the argument for the Public Service Gas Company, contended that either there must be a reduction in gas heat units or an increase in the price of the gas served consumers of the state. Theodore J. Grayson presented the case for the South Jersey companies.

Corporation Counsel Spalding Frazer, of Newark, for the New Jersey League of Municipalities, and George L. Record, for the city of Passaic, both claimed that the contention of Gilmour involved the question of rates, and they pointed out that such an issue should not be injected because the scope of the hearings before th utility commission had not been broad enough to take in that question.

Grayson argued that the issue was one of service in the application before the utility commission and he defined the powers of that body and its duties in this respect.

Boston Company Features Gas Irons and Canning Apparatus

The Boston Consolidated Gas Company is featuring the Humphrey gas iron, which it is selling in large numbers, the price being $4. An attractive window display, with patriotic posters, gives the iron a prominent place, there being two clusters of about 25 irons each, arranged on a sloping board, resembling the prow of a ship.

The Consolidated company is also pushing the use of gas in household canning operations, using the N. C. G. A. posters effectively.

Texas Well Sets a Record for Deep Drilling

Gas Sprayed with Kerosene of 45 Gravity Encountered With Drill at Depth of 4,100 Feet

About a year ago the Empire Gas & Fuel Company of Texas acquired some 30,000 acres of leases in Palo Pinto County, Tex. The earlier drilling had developed several small gas wells in the 1,000-ft. sand. A well had been started, known as the "Chestnut No. 1 Well," to be drilled to this same sand. It was located several miles away from the nearest producing well, and therefore was in "wildcat" territory.

The well was started with 10-in. casing, as is customary for such shallow drilling, explains Alfred J. Diescher, vice-president and general manager of the Empire Gas & Fuel Company, in a recent issue of the *Doherty News*. When the expected sand was encountered it was found to be very thin and practically unproductive at that point. It was determined to make a thorough test of the formations by carrying this well to as great depth as possible, unless oil or gas were meanwhile encountered in paying quantities.

The work was carried on under the general direction of E. E. Yingling, who has charge of the development in Northern Texas, and also has charge of the natural gas pipelines and distributing plants at Mineral Wells, Tex., and at Duncan and Marlow, Okla.

Under the usual practice of drilling the well should have been abandoned at 1,200 ft. depth, but through the special efforts of Mr. Yingling, who carried out his instructions to the letter, one of the record wells of our country has been opened.

Greatest Depth in Mid-Continent Field

Not only has a greater depth been reached in this well than has ever been accomplished before in the Mid-Continent field, but many of the older geological conclusions as to the territory were proven incorrect, and a far greater scope of productive territory disclosed than had heretofore been considered to exist as possibly productive zones.

Great effort was made to carry the 6-inch casing to a great depth, and it was finally set at about 2,400 ft. From this point the well was drilled to a maximum of 4,100 ft., having 1,700 ft. of open hole at the time the sand was encountered. Extreme care and caution were necessary in the drilling of such a deep well with such small-sized casing and with such large amount of open hole, liable to cave at any time.

At 2,300 ft. depth a showing of gas was found, while at 3,000 ft. depth several hundred thousand feet of gas was encountered, and at 4,100 ft. depth the main gas sand was tapped and it was seen that we were likely to have a pay sand at this point.

Owing to the extremely high pressure at which gas at this depth occurs normally, difficult problems were at once encountered, both as to the securing of casing and fittings to carry such high pressure as 1,800 lb. to the square inch—which would be the normal rock pressure of a well of this depth—and the methods of packing and closing in the well to prevent bursting of the casing.

Gas Sprayed with Kerosene of Normal Specifications

It was observed that with the gas coming from the well was a spraying of light liquid which later, upon test in the company's laboratories, proved to be kerosene of 45 gravity, and in all respects within the normal kerosene specifications as to over point and end point.

On closing in the well it was found that this kerosene accumulated in the hole to a depth of approximately 2,000 ft., and that the rock pressure of the well, over and above this kerosene, was about 1,200 lb. The combined pressure at the sand being approximately 1,800 lb., which is normal, made this well the highest rock-pressure well yet enencountered in the natural gas practice.

After several months of underreaming and fighting caves, and fishing troubles, the well was brought to a condition where it was felt safe in drilling into the sand to determine the extent of its production. The well was drilled a few feet at a time, and observations of the quality of gas escaping made, until ultimately the drill had penetrated 14 to 16 ft. Then the gas came in such quantity that after the drill was once removed from the hole it was impossible to lower the drill into the hole, the gas blowing the tools from the hole.

Heat Value of Gas 1,167 Units

At this time the well was making 16,000,000 cu. ft. of gas and spraying from 25 to 30 barrels of kerosene daily. The heat value of the gas, after separating the kerosene,

was 1,167 heat units, which makes it distinctive in this respect from the Northern Texas gases generally.

Not only does this well contain both gas and kerosene, but analyses of the gas show that it contains in excess of 2 gal. of gasolene per 1,000 cu. ft. of gas. A combination of natural gas and kerosene, in such large quantities, condensing in the hole and filling it up for several thousand feet when closed in, makes it stand out as an exceptional well in the natural gas industry.

It involves new theories and observations as to the condition of natural gas in storage underground at high pressure; whether it occurs only as natural gas, or whether it is stored also as liquid, and from this well we hope to derive conclusions of extreme value to us in future operations.

It is impossible to state at this time the full significance of this well and its bearing upon the immense territory held by the Empire Company in this county, which now exceeds 60,000 acres.

AN EVENT IN YEAR'S OPERATION

It must be considered as one of the great events of the year in drilling operations. It is especially valuable on account of the easy drilling, which is shown by the fact that a well started with 10-in. casing could reach a depth of over 4,000 ft., when but a hundred miles north we start with 16-in. casing to reach a depth of 800 ft.

At the present time the Empire companies are drilling several other tests in the field, some of which will be carried to the same depth, unless large paying wells are found shallower. The territory in the vicinity of this well is pretty closely held by the Empire Company, which has now in excess of 50,000,000 cu. ft. of gas available in its various wells. These are so scattered and the shallow sand so proven, that it is a simple matter to increase this by at least 100,000,000 cu. ft. whenever it is desired.

The common practice of oil and gas producers is not to carry their dry holes down to test deeper territory, and the Empire companies have been leaders in searching to greater depths than normal operators generally did. This is but an example of what must come to the organization that will not give up in its search until every effort on its part has been fulfilled.

Lowell, Mass., Increase to Take Effect Sept. 1

Lowell is another city in the state of Massachusetts which will see a raise in rates for gas. Quite a number of other raises have been ordered by the Gas & Electric Light Commission, and some of these are in effect at the present time. The Lowell rate has been raised from 85 to 95 cents per 1,000 cu. ft., the increase to take effect on September 1.

Those raises already in effect which have been noted in the AMERICAN GAS ENGINEERING JOURNAL are: Amesbury, $1.50 to $2; Holyoke (municipal plant), 90 cents to $1; Worcester, 75 to 85 cents; Westfield (municipal plant), $1 to $1.25; Springfield, 85 to 90 cents; Ware, $1.50 to $1.75; Cambridge, 80 to 90 cents; Quincy, $1.10 to $1.20, and Revere, 90 to 95 cents. On Aug. 1 the rate in New Bedford will rise from 90 cents to 95, and the rate in Malden will be increased the same amount.

Heating Rates at Albert Lea, Minn., to Go Up Next Season

Owing to the abnormal price of coal and other conditions Manager Nichols of the Minnesota Gas & Electric Company has been obliged to inform his patrons of Albert Lea that the heating rates for the coming season will be raised.

In talking with the Albert Lea Publishing Company, Mr. Nichols said:

"With the mercury in the thermometer hanging around 90 deg. in the shade, the heating proposition is perhaps out of order, but I want to inform the city of the exact situation now existing so that they can govern themselves accordingly.

"The Minnesota Gas & Electric Company has been losing money on its hot water heating business the past few years and during that period, fuel and material costs were substantially less than at present.

"Contracts for heating service during the season 1917-1918 will be on the basis of a rate averaging between 28 cents and 30 cents per square foot of radiation as against the old rate of 22½ cents.

"The exact rate and form of schedule will be announced at an early date. We are advising as above at this time in order that you may have sufficient opportunity to consider other means of heating your premises, if you so desire."

Investigation and Study of Coking of Illinois Coals Makes Interesting Report

A Most Complete Survey of the Coal and Coking Situation in Illinois is Given in Recent Bulletins by F. K. Ovitz

The Bureau of Mines, Department of the Interior, in co-operation with the Illinois State Geological Survey and the Department of Mining Engineering of the University of Illinois, has completed a study on the coking of Illinois coals, and has published the results of this investigation in Bulletin 138, by F. K. Ovitz.

Mr. Ovitz, in discussing the subject, says:

"In its endeavor to promote a more efficient use of coal the Bureau of Mines, in co-operation with the Illinois State Geological Survey and the University of Illinois, has undertaken an investigation of the coking of Illinois coals. The investigation was started by collecting from various sources the data regarding experiments already made by others; these data have been compiled and are presented herein.

"The present methods of using coal seem wasteful. When coal is burned in furnaces for the generation of steam, only the heat generated by the fuel is utilized; possible by-products are not only lost, but frequently are the source of the smoke nuisance. The volatile matter containing the tar and heavy hydrocarbon gases is difficult to burn completely in many furnaces, and its decomposition produces black smoke. When coal is coked in a by-product oven, the volatile matter is no longer a nuisance but, on the contrary, is the source of many by-products, including benzol, toluol, gas, tar, ammonia, and cyanogen, all of which increase the value that may be obtained from coal.

"The coke that remains after the volatile matter has been driven off is a valuable fuel that can be used for almost all purposes for which bituminous coal can be used, and it is necessary for some metallurgical work. It has about the same heating value as anthracite coal. Because of its cleanness and its burning without smoke, it is well suited for domestic heating and the generation of steam in plants where smokelessness is demanded. The use of coke for these purposes would do much to eliminate smoke in cities.

The best grades are regarded as essential in many metallurgical processes for reducing ores to their metals.

"By-product coking in the United States during the past three years has increased greatly. When the ovens now in course of construction are completed, the total capacity of by-product ovens will be more than double what it was in 1913. This increase has led to a search for coals other than those now known to be available for use in by-product ovens. Tests with coals from the southern part of Illinois has indicated that coke from Illinois coal unmixed with other coals can be used for fuel purposes and that coke from mixtures of Illinois coal with low-volatile coking coal might be suitable for some metallurgical work. In the tests the yield of ammonia was larger than is obtained from eastern coal.

"Evidently the development of methods by which good coke can be made from Illinois coals and the by-products recovered is a matter of high importance. Any investigation that will indicate how, by proper treatment, these coals can be made available to supply the market for coke and gas in the Middle West will increase efficiency in their use, and will aid in conserving the country's supply of high-grade coking coal.

"The first part of this report outlines the present factors in the problem of coking Illinois coals and points out the future prospects. The quality of coke from Illinois coals alone, and from mixtures of Illinois coals with low-volatile coals is described, and the uses for which the coke is suitable are discussed. The gas-making properties and the value of the coals for making by-products are noted. Desirable methods of preparation of the coals, the impurities in them, and the effect of the impurities on the value of the coals for coke and gas making are considered.

"The second part of the report deals with the character of Illinois coals, their nature, physical properties, and chemical composition. The nonhomogenous structure of the coal, the variation in composition of different beds, and even of the same bed in different localities are pointed out. Those districts in which the coals contain the smaller amounts of impurities and are more favorable for coking are grouped together.

"The last part describes the tests made and gives detailed results. The tests are considered under three classes—those with beehive ovens, those with by-product ovens, and those with gas retorts. The details are as complete as the material available permits. The results of a few tests of the coke for furnace or other use are given."

Copies of this bulletin may be obtained free of charge by addressing the Director of the Bureau of Mines, Washington, D. C.

Photo Courtesy of Welsbach Company

STITCHING ROOM IN SHOE FACTORY SHOWING GAS LIGHTS HUNG CLOSE TO MACHINES

Oil and Gas Report

Bowdoin Dome, Montana, Reported on by United States Geological Survey

As it is generally recognized that anticlines or arches in the rocks are the most likely places to find petroleum and natural gas, and as all such places are now being tested with the drill, the United States Geological Survey, Department of the Interior, is calling attention to the Bowdoin dome, near Malta, in northeastern Montana.

This dome is a broadly arched part of the earth's crust from which the rocks dip slightly away on all sides. It is on the main line of the Great Northern Railway just east of Malta, and so far as the structure is concerned it may be regarded as a favorable place to prospect. Natural gas has already been found there in some wells drilled for water, and a deep well has been begun which, if completed, should determine whether or not the dome contains oil or gas.

The dome was examined in the summer of 1916 by A. J. Collier, a geologist of the United States Geological Survey, and is described in Bulletin 661-E, just published.

The rocks in and about the dome are not well exposed, being largely covered by glacial drift, but enough of them was seen to show that the hard rock on the top of the dome is the Claggett shale. The gas already found is supposed to have been contained in the Eagle sandstone, at a depth of about 600 ft. If this sand should not prove to be commercially productive it is possible that oil might be found in sands near the base of the Cretaceous rocks, about 1,500 ft. below the Eagle sand.

A copy of Bulletin 661-E may be obtained free of charge from the Director, U. S. Geological Survey, Department of the Interior, Washington, D. C.

Gas Furnace to Make Candy for Army

Three thousand pounds of peanut brittle a day, to be distributed to Uncle Sam's soldiery soon to be mobilized in and near Atlanta, Ga., is the initial capacity of a blast candy furnace installed recently by the Atlanta Gas Light Company for the Southern Peanut Products Company, 84 Ivy Street, Atlanta, Ga.

Billing System Changed at Atlanta, Ga.—Gas and Electric Bills Combined in One Statement

Twenty-seven thousand customers appear on the combined gas and electric consumer records of the Atlanta, Ga., Gas Light Company, and are billed each month on combined gas and electric and steam heat statements. Many use both gas and electricity; some use one and some the other. But beginning with the bills that for the first time were sent out July 1, by mail entirely, all are billed on a uniform statement.

In April the inauguration of this plan was started by combining the meter readings, one reader visiting each customer to read his meters—gas or electric or both. In May the consumer records were combined, gas and electric being put together. And in June the bills were combined. The change involved tremendous work in the accounting department as well as in the meter reading department. In the latter the combining of gas and electric reader routes, which had been totally dissimilar, proved a heavy and tedious task.

Economies in reading, bookkeeping, billing and postage are gained by the new and simpler method. All readings are now under the supervision of M. H. Pittman, superintendent of the meter subdepartment of the sales department. The reading period remains short—only ten days. A maximum of 24 readers usually are busy at the height of the rush.

Massachusetts Commission Activities

Customers of the Cambridge Gas Light Company have applied to the Massachusetts Gas & Electric Light Commission for a hearing on the price of gas in that city. They seek a reduction in rate from the new price, put in effect July 2. The present price is 90 cents, an increase of 10 cents over the former price.

The commission has granted the Newburyport Gas & Electric Company authority to issue 1,710 shares of new capital stock, at $130 per share, the proceeds to pay for prospective increases and additions to plant.

The Pittsfield (Mass.) Electric Company has petitioned the commission for authority to issue 2,250 shares of new stock at $125.

Preserve at Home
Write or call for our canning folders that tell how to put up all kinds of summer fruits and vegetables with a minimum of effort and expense.
And then take advantage of the convenience and low cost of gas to preserve your winter supply of canned goods at home on your gas range.
It is easy to do. A gas range makes home canning a pleasure. You can work in a cool, comfortable kitchen. The range doesn't heat the room. The fire is dependable and easily regulated—one of the most important factors in canning.
You will be practicing true economy. You can buy fresh products now, when markets are overflowing, and by putting them up prevent waste and add to your personal comfort.
You know how much more you and your friends appreciate home-made things. Now is the time to store away your share.
Let All Who Can Can Can!
The Gas and Electric Co
Lexington Building

ONE OF THE NEWSPAPER ADS IN BALTIMORE CANNING CAMPAIGN

Waterville, N.Y., Plant Need Not be Rebuilt is Commission Ruling

In the case of the Waterville (N. Y.) Gas Company, the Public Service Commission has decided that the company need not rebuild its plant. The commission held that it would be unfair to the company to compel it to continue business without a profit.

When the plant burned down in September, 1916, the company announced that it would go out of business, giving as its reason that it was not possible to make a profit. The trustees of the village of Waterville appealed to the public service commission, which has now upheld the company.

Grant Higher Natural Gas Rates in Kansas City

By a decision of the Federal Courts announced on Aug. 1, higher rates for natural gas are granted in the vicinity of Kansas City. Under the new rate schedule natural gas is to cost 60 cents per 1,000 cu. ft. north of Ottawa, Kan., which district included Kansas City. The territory south of Ottawa will pay 50 cents per 1,000 cu. ft. for gas.

Henry L. Doherty & Company controls the natural gas interests in that neighborhood, and according to the new rate revisions, that company is to receive 57½ per cent of the gross income.

Boston Hotel Adopts Gas Cooking

Following the lead of a number of leading Boston hotels, restaurants and clubs, the Hotel Brunswick, a large hostelry in the Back Bay district, has discarded coal for gas cooking, making its kitchen one of the "all-gas" type.

Personal Notes

A Correction

An erroneous report was circulated and notice published in the issue of July 28 as to the death of H. G. Miller of the Granville (Ohio) Fuel & Light Company. We are very pleased to state that Mr. Miller though having been seriously ill is now much improved and on the road to good health.

Lieutenant Guenette of the general order department of the Peoples' Gas Light & Coke Company, Chicago, who has seen fourteen years of army service, has again said "good-by" to his friends and has departed with his regiment, the Seventh Illinois Infantry, for Houston, Tex.

B. J. Crahan has recently been appointed by the National Public Utilities Company of Philadelphia to be general manager of their properties at Port Huron, Mich., and adjoining territory. Mr. Crahan has been manager of the Joplin (Mo.) Gas Company for eight years.

John W. McMillan, who succeeded B. J. Crahan at Portsmouth, Ohio, will now take Mr. Crahan's place as manager of the Joplin (Mo.) Gas Company.

W. E. Bertke, superintendent of the gas department of the Utah Power & Light Company of Ogden, Utah, for the past three years, has resigned and accepted the position of manager of the Great Falls (Mont.) Gas Company. Mr. Bertke has had charge of the local gas properties during an extensive campaign of improvements and extensions in the system. His successor has not been named by the local company.

J. Bowdoin Cocke, formerly superintendent of the Rocky Mount (N. C.) Gas Company has recently resigned his position to accept the managership of the gas department at Newport News, Va.

Societies and Associations

THE ILLUMINATING ENGINEERING SOCIETY'S Correspondence Convention which this year will replace the regular Annual Convention will be inaugurated during September by the release of the following papers: Presidential address by W. J. Serrill; Report of Committee on Nomenclature and Standards, A. E. Kennelly, chairman, and C. H. Sharp, secretary; Illuminating Engineering Publicity, by G. H. Stickney; Economics of Large Building Lighting, by C. L. Law and J. E. Buckley, and Illumination Intensities in Large New York Department Stores, by W. F. Little and J. F. Dick. President Serrill's address, not being submitted for discussion, will appear in the transactions of the society issued about the first of September. The three papers and the report will be distributed in pamphlet form to anyone who applies for them to the society at its headquarters, 29 West 39th Street, New York, N. Y. A general invitation is issued for written discussion of each of these papers to be printed with the names in the transactions of the society. Any of these papers may be presented before meetings of sections of the society during the month of September. They will be released to the technical press for publication in full or in abstract at any time subsequent to the 20th of September. Other papers of this Correspondence Convention will be released in similar fashion during October, November and December respectively.

Construction Notes

Gas Turned into New College Park Extension by Atlanta, Ga., Company

Gas was burned on the new East Point-College Park extension made by the Atlanta, Ga., Gas Light Company, for the first time, July 20, immediately following the purging of all air from the direct mains. Superintendent C. J. Weinmeister, of the mains department, on July 23, resumed his work of removing air from the branch mains of the complicated new system and filling them with pure gas. Immediately behind Mr. Weinmeister's men followed those of the shops department, under A. H. Wimberly, making connections, setting meters and installing services.

Some two hundred and fifty new customers are to be served on this extension just as fast as they can be reached. The work is tedious, and because Camp Gordon's, one of the new army cantonments, construction is drawing large numbers of men from the local supply, labor is none too plentiful. Notwithstanding these handicaps the work will be rushed, and it will not be long before College Park and East Point can boast the same complete list of modern conveniences as Decatur and Atlanta.

Work on the extension was started by Superintendent Weinmeister's department May 29, 1916, and would have been completed weeks ago but for the fact that several stretches of mains had to be taken up and relaid when street grades declared to be permanent were raised or lowered.

New Holder to be Constructed at Daytona, Fla.

The Daytona (Fla.) Public Service Company, one of the subsidiaries of the Gas & Electric Improvement Company, Boston, has contracted for another holder, of 200,000 cu. ft. capacity, to provide for the great increase in the demand for gas in that famous winter resort. The new holder will be erected on a new lot recently bought by the company, about 100 ft. from the present gas works.

New By-Product Coke Plant to be Built in Illinois

The By-Products Coke Corporation of Chicago, Ill., has announced plans for the immediate construction of another plant at Indiana Harbor in the Calumet district, Chicago.

The company has purchased a 50-acre tract on the Michigan-Illinois drainage canal between the Pennsylvania and the New York Central rights of way and directly opposite the old plant of the Inland Steel Company.

The new plant will represent an investment of several million dollars, it is announced, and its products will be coke, benzol and other coal tar distillate compounds. The entire output of the plant, it is said, will be taken over by the Marks Manufacturing Company from whom the By-Products Company purchased the

LaPorte, Ind., Company Wants to Place Stack at End of Public Street

The LaPorte Gas & Electric Company is hoping to build its new 175-ft. smokestack at the foot of Monroe Street, LaPorte, Ind., alongside its plant. The company is now negotiating with the city to have this short portion of the street north of Washington Street vacated. The company owns all the property on both sides of the street except a strip on the northeast corner occupied by a two-story brick warehouse and owned by Frank Morrison. The stack will be about 25 ft. square at the base and take up nearly all the street. This street does not extend across the tracks and the company figures that the portion it wishes vacated is of no use to anyone but it.

The contract for the stack has been let to the General Concrete Construction Company of Chicago, which has agreed to complete the work in 55 days. The electric company is getting all its current now from the Indiana & Michigan Company, but expects to have its own plant in operation again by Tuesday.

Gas Steam Installations at Atlanta, Ga.

Gas steam radiation for the Sunday school room of St. Philip's Cathedral (Episcopal), at Washington and Hunter Streets, Atlanta, Ga., has been contracted by the Atlanta Gas Light Company. This installation will consist of eight different sizes of radiator.

Ten gas steam radiators are covered by similar contract made with E. L. Douglas for heating the new building he is constructing at Peachtree and West Peachtree for occupancy by a battery company.

New Business, Born of War Conditions, Uses Gas

Anything anybody wants canned, up to tons of it, will be put up by the American Canning Corporation, 78 Auburn Avenue, Atlanta, Ga., with the aid of a gas canning furnace recently installed on its order by the Atlanta Gas Light Company. This is a new business in Atlanta. War conditions created its field. The company will sell canning outfits, or itself will do the canning for patrons.